Demographic and socio-economic determinants of female migration in rural KwaZulu-Natal

by

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Abstract

Female migration in South Africa has been on the increase over the years. This thesis attempts to look at the demographic and socio-economic factors that drive this increase using data from the Africa Centre Demographic Information System (ACDIS) during the period 2001 and 2008. Using data that provides for timing of events such as migration and births, the study analyses the time it took females to migrate. Migration was defined as having out-migrated the Demographic Surveillance Area (DSA) and never coming back. Migration levels were found to be high with 28 per cent of the females between 15-49 years of age out-migrating from the DSA. Models were created to explore the demographic and socio-economic factors controlling for other known determinant of migration. In the logistic regression, odds ratios showed that parity and childbearing status were important predicators of female migration. Females with four children were less likely to out-migrate the DSA (a 61 per cent less chance of migrating compared to females without children). Furthermore, pregnant females were not likely to migrate (a 45 per cent less chance of migrating compared to females who are not pregnant or breastfeeding). In a survival analysis, determinants of timing of migration showed that females with high parities had a higher survivorships to out-migration, compared to females who were pregnant. Hazard ratios also showed that females with four children are not likely to migrate compared to females with four children (a 7 per cent less hazard of migrating compared to females with no children). Age, marital status and educational attainment were also found to be predictors of female migration. Older females were less likely to migrate compared to younger females (females in the 44-49 age group had a 70 per cent less hazard of migrating compared to females in the 15-19 age group). Currently married and cohabiting females had a 29 per cent less hazard of migrating compared to never married females. Females with high educational attainment were more likely to migrate compared to females without education (an 18 per cent higher hazard of migrating compared to females without education). The timing of migration showed that pregnant females migrate after five years into the start of their pregnancy (date of conception). In conclusion, females with many children and females who are pregnant or breastfeeding are not likely to migrate.

Declaration

Submitted in fulfilment / partial fulfilment of the requirements for the degree of Masters in Population Studies in the Graduate Programme in the School of Development Studies, University of KwaZulu-Natal,
Durban, South Africa.

I declare that this dissertation is my own unaided work. All citations, references and borrowed ideas have been duly acknowledged. I confirm that an external editor was used and that my supervisor was informed of the identity and details of my editor. It is being submitted for the degree of Masters in Population Studies in the Faculty of Humanities, Development and Social Science, University of KwaZulu-Natal, Durban, South Africa. None of the present work has been submitted previously for any degree or examination in any other university.

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Student signature

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Date

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Editor name and surname (*if applicable*)

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Acronyms

ACDIS Africa Centre Demographic Information System

DSA Demographic Surveillance Area

DSS Demographic Surveillance System

HSE Household Socio-economic Round

HSRC Human Science Research Council

INDEPTH International Network for the continuous Demographic and Evaluation of Populations and their Health

OHS October Household Survey

Definitions

Bounded structure

Bounded structure is a building(s) belonging to individuals or organisations in the DSA.

Demographic Surveillance Area

This is the geographical area where the DSS is situated.

Demographic Surveillance System

A system that allows for tracking of geographically located populations in a specified area.

Eligibility criteria for this study

Females in the DSA have to be a resident and between the ages of 15 and 49 years during the period between 1 January 2001 and 1 April 2008 in order to be considered.

Episode

Episode is an event that has a start and an end. For this study, the episodes being considered are the ones that ended in an out-migration.

Event

This is the occurrence of any phenomenon that can be defined and located in time. For instance births, migration and deaths.

Exit criteria

When a female in the DSA turns 50 years, dies during the observation period or ceases to be a resident, the individual exits the study.

Household

This is a unit of a DSS in addition to individuals and residential units.

INDEPTH Network

This is a compilation network of various DSS sites in developing countries mainly in Africa and Asia.

Migration

The Africa Centre defines migration as any change in residency. For this study, migration refers to out-migration. In addition, females can only qualify for residency if they are residents in the DSA.

Out-migration

Females are said to have out-migrated the DSA if they left the DSA during the period between 1 January 2001 and 1 April 2008 and never returned by 1 April 2008.

Parity

The total number of children a woman has ever given birth to.

Residency

Time spent living in a bounded structure by an individual.

Resident

Females are only considered residents in the DSA if they stay in a bounded structure in the DSA and normally leave in the same bounded structure as the household.

Survival analysis

This is the analysis of time to the occurrence of an event.

Chapter One
Background and Introduction

1.1 Introduction

This chapter introduces, justifies, and investigates the significance of the research topic in relation to existing literature on female migration. Female migration in South Africa has been on the increase and the study seeks to illustrate that females are not only on the move due to socio-economic but demographic factors as well.

1.2 Background and outline of the research problem

Female migration in South Africa has been on the increase. Evidence provided by recent studies suggests that internal female migration in South Africa has increased substantially in the post-apartheid era (Posel and Casale, 2006). An analysis of various national household surveys in South Africa in 2003 showed an increase of approximately 14 per cent; from 30 per cent in 1993 to 34 per cent in 1999 (Posel, 2003). A historical count in South Africa indicates that migration used to be male dominated and females usually left behind. During the apartheid era in South Africa, acts and laws such the Land Act 27 of 1913 and Urban Areas Act of 1923 were introduced by the White administration to control movements of the Black population. The Black population had to stay in designated areas known as homelands. Black males were allowed to migrate from the homelands to urban areas to work in gold mines only but were not allowed to settle permanently in urban areas (Wentzel and Tlabela, 2006). This system meant that Black males had to go back to the rural areas or the homelands to visit their families, resulting in oscillatory movements from the mines usually situated in urban areas to the homelands and vice versa. It provided Black males with the opportunity to remit money back to their families in the rural areas.

In the post-apartheid era, Black females are now also on the move and this can be attributed to historic and economic reasons. Legislations such as the Urban Areas Act have been abolished, thus Black females have become free to move (Wentzel and Tlabela, 2006). Initially in South Africa most rural households relied on remittances from male labour migrants for survival in addition to other sources such as farming. This is changing. Posel and Casale (2003a) argue that lack of, very low remittances, or reduced

potential of other income sources, have automatically pushed females to move and look for earnings. High levels of unemployment have meant that the remittances that were sent by males to support their families back in the homelands or rural areas have reduced over time. As a result females try to venture into the job market to look for other ways of survival which lead them to moving. In addition, household structures in South Africa are changing with more and more households being female headed and these females are being pushed into the labour market to take care of their families (Casale and Posel, 2002; Posel and Casale, 2003).

This study uses DSS data where DSS stands for Demographic Surveillance System. The data is prepared by the Africa Centre which is collected through surveillance. DSS data from the Africa Centre is commonly known as Africa Centre Demographic Information System (ACDIS). DSS tracks localised populations over a period of time with the intention of collecting vital demographic information such as births, deaths and migration. According to INDEPTH Network (2002) the advantages of using DSS data, unlike the census or survey migration data, is that recall errors are minimised, multiple moves are effectively captured, and past moves can easily be differentiated from recent moves. There is an accurate record of when individuals in-migrate and out-migrate the DSA. In addition, the Africa Centre DSS data collects information of births and migration simultaneously thus providing dates on the timing of such vital events. Most data elsewhere do not have both of this information recorded.

The area covered by DSS is known as Demographic Surveillance Area (DSA). The ACDIS covers the local population in the DSA, located in the northern rural part of KwaZulu-Natal, Mtubatuba Municipality, South Africa and deals with approximately 12,000 households (INDEPTH Network, 2002; Muhwava *et al.*, 2007). The rural KwaZulu-Natal context indicates that most recorded moves are taking place between the DSA to other rural areas, districts and business centres, such as industrial towns. Due to the search for better employment and economic opportunities, individuals usually move to neighbouring towns such as Durban, Richards Bay, Empangeni or to sugar cane and forestry commercial farms. In other words, circulatory migratory moves which are usually instigated by employment opportunities happen between towns and commercial centres (Muhwava *et al*., 2007). The analysis of in-migration and out-migration in the DSA using ACDIS data from 2000 to 2006 indicate that total in-migration rates for both

males and females remained relatively the same from 2000 to 2006. On the other hand, females had lower out-migration rates than males. An out-migrant is defined as "a person originally listed on a DSS round as a resident, or a person who became a resident after the round by birth or immigration, who subsequently moved out of the surveillance (DSS) area permanently" (Muhwava and Nyirenda, 2007: 16).

Many studies have focused on females migrating for socio-economic reasons (Casale and Posel, 2002; Posel and Casale, 2006) or have heavily focused on male migration, or given less attention to demographic and socio-economic determinants of female migration, and as a result the subject remains under-researched. The *status quo* of males traditionally migrating for various reasons, leaving females and children behind, is being challenged. Lately there has been renewed interest in seeking to show that females are also on the move (Posel and Casale, 2006). A few studies (Camlin, 2008; Myer and Harrison, 2003) in rural KwaZulu-Natal have attempted to investigate demographic factors such as childbearing status; pregnancy or breastfeeding for instance, increases risk of migration, as do socio-economic factors. This study aims at filling this research gap by investigating the effect of demographic and socio-economic determinants on the probability to migrate between 2001 and 2008 using ACDIS data. Camlin (2008) has looked at how sex differentials influences migration in rural KwaZulu-Natal but few studies have focused on the demographic and socio-economic determinants of female migration, specifically in the Africa Centre Demographic Surveillance Area. The study by Muhwava and Nyirenda (2007) looked at socio-economic determinants of migration in the ACDIS, others have looked at the definition of migration and its operations in the ACDIS (Muhwava *et al.*, 2007). Some have analysed the effect of social pension on the possibility of an individual being a labour migrant (Ardington *et al.*, 2007), or the effect of circular migration in spreading HIV and sexually transmitted diseases in rural KwaZulu-Natal (Lurie *et al.*, 1997).

1.3 Defining migration

Migration involves the movement of an individual from one place (place of origin) to another (place of destination) with the intention to settle (Statistics South Africa, 2006). Migration can also be broadly categorised as internal and international. Movements that are confined within a country are referred to as internal whereas international migration is defined as movement across countries (Kpedekpo, 1983). If an individual usually resides

in or is in country A and then moves to country B he or she is considered an immigrant in country B. From the perspective of country A (where the move originated), such an individual will be classified as an emigrant (Statistics South Africa, 2006). The movements between these two countries (countries A and B) are known as international migration. On the other hand movements within a country are referred to as internal migration. The geographical areas involved in internal migration usually involve movements between geographical areas such as rural and urban areas, districts councils, municipalities or provinces (Mostert *et al.*, 1998). A term closely related to migration is mobility. Both migration and mobility are characterised by the concepts of place of origin and place of destination although the definitions differ. One way in which to distinguish between migration and mobility is that migration usually includes the crossing of a politically designated boundary whereas mobility is movements that do not involve crossing a politically designated boundary (Hinde, 1998; Kpedekpo, 1983; Morrison *et al.*, 2005).

One of the major problems in defining migration is deciding which moves constitute migration or finding a criterion that distinguishes migrants from non-migrants. Lack of uniformity in the definition has meant that it varies depending on circumstances (Statistics South Africa, 2006). Ideally the definition should include change in usual residence and crossing a geographically designated boundary (Kok *et al.*, 2003). In most circumstances, both of these criteria are not uniformly applied. The problem of uniformity also means that comparing migration trends across years may not be easy since different studies define migration differently. For instance, the 2001 South Africa census used date and place as a guide to determine whether a person is to be considered a migrant or non-migrant. If an individual had not changed the usual place of residence between the 1996 and the 2001 South Africa census, they were considered to be non-migrants. Anyone who had changed places apart from the place of enumeration was considered a migrant. The 2001 South Africa census was able to identify households with temporary labour migrants (Statistics South Africa, 2006). These types of migrants are historically defined as individuals normally working or employed in urban areas but still maintaining links with a common base, usually a rural area. Links take the form of occasionally visiting or remitting money back to the household (Kok *et al.*, 2003).

The issue of defining migration in South Africa is related to the problem of defining certain geographical areas (Kok *et al.,* 2003). Since most of the internal migration in South Africa happens between geographical areas such as rural and urban areas, metropolitan areas, magisterial districts and provinces, it is important to briefly look at the definitions. The Statistics South Africa (2006b) document on changing migration and settlement patterns in South Africa, proposes that metropolitan areas be defined as economic chambers since most of the economic activities of a country predominantly happen here. The importance of defining metropolitan areas is due to the fact that most internal migration in South Africa occurs from non-metropolitan to metropolitan areas, that is, more than 75 per cent (Statistics South Africa, 2006b). Examples of metropolitan areas which attract individuals from the other areas include Johannesburg and Durban.

The definition of urban and rural areas in South Africa is also quite contentious (Gelderblom, 2003; Kok *et al.,* 2003; Statistics South Africa, 2003). Nevertheless, as an informal simple guide, most scholars (Gelderblom, 2003; Kok *et al.,* 2003; Shryock and Siegel, 1971; Statistics South Africa, 2003; Statistics South Africa, 2006) argue that for an area to be considered urban, it must have at least one or all of the following components, namely, economic activity in the area; majority of the population engaged in non-agricultural activity; close proximity between residential areas and services such as water, health and education facilities; a certain type of street pattern or structured arrangement in the residential areas; or the presence of a local government. By 1996, half of the South African population lived in places defined as urban areas (Kok *et al.*, 2003).

1.4 Definition of migration in the study area (Africa Centre)

This study will be using data from the Africa Centre Health and Population Studies Demographic Information System (ACDIS) and it is important to note how migration is defined in this system. It is defined as any change in residency, that is, any individual who changes a place of residence is considered a migrant. The Africa Centre Demographic Surveillance Area (DSA) has bounded structures which are defined as a "building, or a group of buildings, on land belonging to a single person or organization" (Africa Centre, 2008: 20; Hosegood and Timæus, 2005). The three criteria used to distinguish between a resident and a non-resident include opinion of the individual or other household members, time spent in the bounded structure, and , movements made into or out of the bounded structure (Muhwava *et al.,* 2007). An individual in the ACDIS

becomes a resident by staying in a bounded structure. Therefore, residency is the time spent living in a bounded structure, or rather, physical presence (INDEPTH Network, 2002; Muhwava *et al.,* 2007). According to Muhwava and Nyirenda (2007) referring to the ACDIS, a resident is an individual who would have spent most nights in a bounded structure. A non-resident is an individual who does not usually reside in the structure but is considered a household member. Some of the complexities and limitations associated with this criterion are that there is no standard duration attached to the period of being away. In addition "there are instances where the residency status is not easy to classify especially when the member has an unpredictable pattern of presence at the bounded structure, and perhaps has no clearly-identifiable place of residence elsewhere" (Muhwava *et al.,* 2007: 18).

1.5 Research questions

The study attempts to answer the following questions:

a) What are some of the demographic and socio-economic factors affecting female migration in rural KwaZulu-Natal?

b) Is female migration associated with particular stages around childbirth or the total number of children a woman has ever given birth to (parity), controlling for known determinants of migration?

1.6 Theoretical framework

This study focuses on a theoretical framework that will assist in explaining why females migrate. Although the framework is mainly based on an Asian and western setting, it nevertheless it provides a framework for why females migrate. According to Huong *et al.* (2010), this is achieved by examining rationalist, structuralist, relational and transnational theories of migration. According to Sassen (1988), the structuralist theory of migration states that labour market structures such as multinational corporations in industrialised countries are pull factors which facilitate migration. The preferential recruitment process of these corporations who favour female migrants means that more and more females from the rural areas migrate to these structures that are usually located in urban areas. Females engage in migration for various reasons such as economic empowerment to better their lives, for personal growth such as improving self-esteem, or for purposes of reunification with their families (Huong *et al.,* 2010). Labour participation is one of the pull factors of female migration. By 2005, the number of international female migrants

had increased by approximately 8 per cent from 46 per cent in 1960 to 49.6 per cent in 2005 (United Nations, 2005).

According to Borak (2005), the Asian context is unique because of changes in the global labour markets such as the industrialisation processes that some Asian countries are undergoing. More and more females are entering the job market through skilled and unskilled labour which has been characterised as the feminisation of labour migration (Ong, 1991). Females are migrating globally and locally into unskilled sectors such as domestic and care work or the entertainment industry. Europe is experiencing more and more female migrant flows from the Philippines and Latin America (ILO, 2003). The South African context shows that most female migrants enter the informal markets as petty traders (Dodson, 1998). Relational theory of migration argues that gender differences play a significant part in influencing migration processes by investigating transnational or gendered divisions of labour (Piper, 2005). Migration provides positive opportunities such as source of income but also invites exploitation since most migrant females enter professions that are not necessarily deemed as work, for instance the entertainment industry or care work, or they have migrated illegally and are thus prone to physical, economic and psychological abuse (United Nations, 2007).

Many theories and laws have been put forward to explain the phenomenon of migration (Massey *et al.*, 1993). The migration law of push and pull factors was formulated around 1889 by Ernest Ravenstein and later modified by Everett S. Lee (Lee, 1966). Lee outlines the laws that form the basis of the existing migration theories. One of the laws proposes that the will to better oneself economically usually outdoes the harsh economic prospects such as high taxation rates and high inflation rates in the place of destination (Lee, 1966). The search for better economic prospects through push and pull factors facilitates migration. Push factors usually include unfavourable issues that force one to migrate out of an area such as high costs in consumption goods or capital and pull factors are usually favorable issues that attract one to migrate to another area such as employment prospects (Massey *et al.*, 1993).

Social factors such as family formation are made possible by entry into a marital union, or fertility, which encourage or inhibit female migration. Marriage through the process of family formation is one of the main backgrounds for female migration (Nedoluzkho and

Agadjanian, 2009). Demographic factors such as marriage may influence female migration prospects by either encouraging or inhibiting such prospects. Typically migration is viewed as a male domain which means that most migratory moves are made by males and only thereafter do females follow. Such moves are instigated by the need to start a family or reunite with a husband. Marriage, which is a demographic factor, also facilitates this process. After marriage, females move to the husband's home to start a family (Houstoun, Kramer and Barrett, 1984; Pedraza, 1991). Family reunification is an important reason for female migration. Females also enter North America and Europe as wives (Khoo *et al.*, 2005). Married-related migration might be caused by two reasons, namely females migrating to their husband's home once married, and females migrating to where a spouse is located to legitimise the union in order to avoid having a baby born out of wedlock. Literature from the Western setting suggests that female migration is also shaped by fertility through out-of-wedlock pregnancies. For instance in Kyrgyzstan, the chances of female migration are high if females perceive that the child might end up being born out of wedlock. Marriage-related migration during this time is likely to avoid stigma and legitimise the union (Nedoluzkho and Agadjanian, 2009).

While marriage may instigate female migration in the Western setting, this might be in contrast with South Africa given the different dynamic aspects of family structures for instance cohabiting and singlehood. Given this background, it is not likely that female migration in South Africa is mainly instigated by migrating for marriage purposes. In addition, South Africa is characterized by low marital rates (Posel and Casale, 2003a) and this might be in contrast with females migrating to join a marital union unlike the Western context. On the other hand, childbearing process might be influencing female migration in South Africa. In the absence of maternal hospital care in the areas females reside in, there is a possibility of pregnant females moving to areas where they can access such services. Myer and Harrison (2003), undertaking a qualitative research in rural KwaZulu-Natal on reasons why pregnant females seek antenatal care late in their pregnancies, found that out of all the females interviewed, less than 40 per cent had close proximity access to antenatal clinics. More than 60 per cent made residential moves from their households to areas where the clinics are located either by taxi or walking. The South African context seems to suggest that females might be migrating due to other reasons such as moving for economic purposes. For instance, authors Casale and Posel

(2002) such as note that over the years, the informal sector has been growing which has resulted in more females being lured to informal employment.

1.7 Conclusion

Defining migration in South Africa can be problematic due to defining spatial geographical areas such as magisterial districts, urban and rural areas. This study will adopt the more conventional definition of migration, namely moving from one place to another with the intention of settling there. Females move for economic reasons in the hope of getting a job or increasing earnings in the place of destination. This study seeks to understand the reasons behind the increase of female migration in South Africa by investigating not only the socio-economic factors influencing female migration in rural KwaZulu-Natal, but also the demographic factors.

Chapter Two
Review of Related Literature

2.1 Introduction

This chapter will focus on migration patterns in South Africa; how migration typically used to be characterised by male labour migration; and how female migration was restricted in pre-1994 South Africa. Increased female migration in the post-apartheid era in South Africa will also be discussed. One of the focus areas of this thesis is to explore the effects of female demographic characteristics on the decision to migrate. These characteristics include the total number of children a female has ever given birth to (parity); childbearing status (none, pregnancy, breastfeeding and multiple); age and marital status. Educational attainment and female participation in the labour force will also be discussed as possible socio-economic determinants of female migration.

2.2 A historical account of migration in South Africa

Early studies on migration heavily focused on male labour migration to the mines with females rarely mentioned or placed. One of the reasons for this was the nature of the mining occupation which was not a suitable environment for females and females with children. Mining was viewed and perceived as male work and the role of females was the continuance of agricultural production in the homestead and rearing children (Beinart, 1982; Bozzoli, 1983; Harries, 1982). Initially the Black population resided in rural areas but over time as South Africa went through political changes during apartheid, the then White administration decided that Blacks and Whites had to live and be governed separately. This was made possible by enacting laws such as the Land Act 27 of 1913 which sought to relieve most of the Black population of their rural land over time. Later these rural areas came to be known as homelands. Each South African tribe had its own homeland (usually a small portion of land) and a chief who controlled the Black population (Butler *et al.*, 1977; Thompson, 2000). Although the discovery of gold in Kimberley was in 1886, only much later was there labour migration from the homelands to urban areas. Labour migration to the mines from the homelands was predominantly undertaken by Black males (Walker, 1990). It was meant to be temporary, thus migrant labourers were not allowed to settle permanently in urban areas. Control acts imposed by the then White administration on the Black population such as residence controls and the

Urban Areas Act of 1923 ensured that movement from the homelands was curtailed (Butler *et al.*, 1977; Gelderblom, 2004; Wentzel and Tlabela, 2006).

Black females were not part of the highly organised migrant labour system which entailed being recruited by mining employers or being sent out of the homelands by chiefs (Wells, 1982). According to Whiteside and Schlemmer (1986) and Hindson (1987), the recruiting of Black males into a highly organised migrant labour system meant that more and more individuals were lured into the mining business. By 1912, more than three quarters of Black South African males were arriving at the recruiting centres headed by the Chamber of Mines. Black males were allowed to migrate from the homelands to urban areas for purposes of working in gold mines only but were not allowed to settle permanently in these areas (Wentzel and Tlabela, 2006). Writers such as Beinart (1982) also argue that when it comes to migration in the pre-apartheid era in South Africa, females are rarely mentioned in isolation but usually fall under the guise of, or are combined into words such as 'family', 'domestic community' or 'family labour'. Females therefore do not feature in historical studies.

For Black males the benefits of migrating were offset against the benefits of staying in the homelands, and they made conscious independent decisions to migrate. Rewards included the ability to earn cash from migrant labour that could be remitted back to their families in the rural areas or used as bride-wealth payments (Harries, 1982; Posel, 2001). Walker (1990) explains the reason why Black males engaged in (male) migration as opposed to Black females situated in the homelands, arguing that "because of the way in which the homestead economy operated, it was the young, unmarried man who could most easily be released by the homestead – and he, therefore, who was the first to be drawn into wage labour" (Walker, 1990: 173).This implies that historically, age and marital status played a crucial role in affecting the decision of who ultimately migrates. In addition, husbands, chiefs and elders in the homelands sought to carefully control movements so that females continued with their roles of homestead production (Walker, 1990). For instance, in the case of Zululand, Guy (1982) states that females "had to be identified by a man known to the pass officer before they would be given permission to leave the colony. After 1899 no female was to be issued with a pass unless accompanied by her male guardian" (Guy, 1982 cited in Walker, 1990: 180). A male guardian in this case could be a father, husband or son.

Despite the lack of statistics on the number of Black females migrating from homelands to urban areas, there is a significant difference in the number of Black females who were residing in the homelands and the ones located in urban areas. Evidence from the 1911 South Africa census shows that out of the total Black African urban population, the percentage of Black African females living in South Africa was less than 20 per cent. It was below 100,000 in 1911 and approximately 147,000 in 1921. This represents an increase of 47 per cent between the two periods (Hindson, 1987). Statistics provided by the 1936 South Africa census cites that 52.6 per cent of Black African females resided in homelands, and - and 11 per cent in urban areas (Walker, 1982). The number of females residing in urban areas was close to five times the number of Black African females residing in homelands. This is further testimony that Black females generally remained in rural or homeland areas. On the other hand the number of Black females residing in the white owned farms was 36.4 per cent (Walker, 1982). This is three times the number of Black females in the urban areas, and slightly lower than the number in homelands. According to Gelderblom (2004), owners of white owned farms hired Black population labour to work on the farms, and the farm owner had the power to evict a migrant labourer.

2.3 Migration trends in South Africa

Migration levels in South Africa over the years do not seem surprisingly high. During the period between 1996 and 2001, only 13 per cent of the South African population counted in the two censuses had migrated from one province to another. It was also concluded that the Black population migrated more often than the Whites or Indians (Statistics South Africa, 2006). Perhaps this can be attributed to the fact that the Black population was historically shaped by control acts and were thus migrating back and forth from the homelands to urban areas only for purposes of working there. According to data from the migration community profile in the South Africa Census 2001, less than 8 per cent of South Africans and foreigners moved between magisterial districts of the different provinces between 1996 and 2001, whereas less than 9 per cent moved between 1992 and 1996. There is thus no marked difference in the percentages of South Africans moving between these two periods (Statistics South Africa, 2006). Migration volumes can also be deduced from provincial movements. Interprovincial migration is considered as migration from one province to another.

Anderson (2006) argues that in the period between 1992 to 1996, most of the inter-provincial migration patterns occurred from other provinces to either Gauteng or the Western Cape. Out of a population of approximately 44.8 million (2001 South Africa census), only 5.6 million in 1996 and 2001 reported to have changed residence more than once between provinces (Statistics South Africa, 2005). This represents 12.5 per cent of the South African population having engaged in internal migration during these two periods. If an individual had stayed for four days in a week or more at a place, this was considered to be the residency. By using a 10 per cent sample of the 1996 South Africa census, most of the migration streams occurred from other provinces to Gauteng (Kok *et al.,* 2003). Gauteng was also the province with the highest number of individuals moving from the area between 1992 and 1996. Between 1996 and 2001 there were 5.5 million migrants in South Africa with the Black population representing approximately 3.7 million (Kok *et al.,* 2003). These results have to be interpreted with caution since only 10 per cent of the 1996 South Africa census was analysed which means not all the individuals were considered.

Studies done using the Africa Center DSS data conclude that in- and out-migration rates between 2000 and 2005 increased over time. Overall, male in-migration rate increased by 3.79 per cent, from 1.78 per cent in 2000 to 8.52 per cent in 2005 (Muhwava and Nyirenda, 2007). There was no marked difference between male and female in-migration. Female in-migration rate on the other hand increased by 4.02 per cent, from 1.81 per cent in 2000 to 9.09 per cent in 2005 (Muhwava and Nyirenda, 2007). Male out-migration rate also increased during this period by 12.97 per cent, from 0.79 to 11.04 per cent (Muhwava and Nyirenda, 2007).

The Human Science Research Council (HRSC) is a research body in South Africa which carried out an HRSC 2001-2002 migration survey with the aim of establishing the intentions to migrate in the near future. This survey covers migration related questions such as previous and present residence, intention to migrate elsewhere and individuals' knowledge of other towns apart from the ones of current residence (Kok *et al.,* 2006). The HRSC 2001-2002 migration survey using logistic regression shows that out of 3618 households, 24 per cent and 4 per cent had an intention to migrate temporarily and permanently during the next 12 months and five years respectively (De Jong and Steinmetz, 2006). The survey deduced the intention to migrate within the next 12 months

by asking individuals questions such as ‘do you plan to move out of the origin and settle permanently into the destination (a rural or urban area)?’ Secondly, ‘do you plan to move out of the place of origin to seek employment or for other reasons to another destination then relocate back to this place of origin?’ The origin in this case was where an individual was currently based and the destination was the place of temporary or permanent settlement (De Jong and Steinmetz, 2006). According to Morrison *et al.* (2005) this kind of study could be evaluated in the future by checking whether the respondents who had an intention to migrate actually did so.

2.4 Contemporary status of female migration in South Africa

Recent studies provide evidence to suggest that internal female migration in South Africa has increased substantially over recent years in the post-apartheid era (Posel and Casale, 2006). According to Posel (2003) an analysis of various national household surveys in South Africa showed an increase in internal female migration flows by approximately 14 per cent, from 30 per cent in 1993 to 34 per cent in 1999. The Agincourt demographic surveillance system (DSS) is a demographic surveillance that tracks local population health status, mortality, fertility and migration patterns. The DSS covers the Bushbuckridge region located in the northern part of South Africa which deals with close to 10,500 households and 67,000 individuals (INDEPTH Network, 2002). Agincourt DSS indicates that during the period between 1997 and 2000, female labour migration between the ages of 35 to 54 years increased by approximately 67 per cent (Khan *et al.*, 2003). This increase can be attributed to historic and economic factors. In the post 1994 era, the movement acts and legislations such as the Urban Areas Act were abolished this gave Black African females the freedom to move (Wentzel and Tlabela, 2006).

Female labour force participation has been increasing over the years such that “in 1960 females accounted for 23 per cent of the labour force in South Africa. By 1985 this had risen to 36 per cent and by 1991 it had reached 41 per cent” (Standing *et al.*, 1996: 60). Further evidence provided by studies from the Agincourt DSS also found an increase in female labour migration of approximately 60 per cent, from 15 per cent in 1997 to 25 per cent in 2001 (Collinson *et al.*, 2003). However, high unemployment in South Africa also means that permanent female labour migration in the urban areas is inhibited. The chances are that females will continue engaging in temporary rather than permanent migration (Posel and Casale, 2006). Temporary labour migrants are historically defined

as individuals who normally work or are employed in the urban areas but who still maintain links with a common base, usually the rural area. Links take the form of occasionally visiting or remitting money back to the household (Kok *et al.*, 2003). Due to limited job opportunities, female migrants may decide to go back to the rural areas. It is advantageous for both male and female migrants to relocate back to the rural areas and forego incurring additional costs such as rent payment associated with continued stay in urban areas (James, 2001).

Females in post-apartheid South Africa are moving from rural to urban areas and vice versa, including moving from one province to another. An analysis of the interprovincial migration patterns using the 1996 South Africa census shows that female migrants exceed male migrants in all provinces except Gauteng where 51 per cent of the 1996 population were comprised of males (Kok *et al.,* 2003). Although the authors do not provide a breakdown of the number of migrants to the metropolitan areas, namely Gauteng, the Durban functional region, greater Cape Town and Port Elizabeth-Uitenhage, into different sexes, approximately two-thirds of all moves from Gauteng ended in KwaZulu-Natal province (Kok *et al.,* 2003).

In rural KwaZulu-Natal, most moves being recorded are between the DSS area and other rural areas, districts and business centres such as industrial towns. Due to the search for better employment and economic opportunities, individuals usually move to neighbouring towns such as Durban, Richards Bay, Empangeni or to sugar cane and forestry commercial farms. In other words, circulatory migratory moves which are usually instigated by employment opportunities happen between towns and commercial centres (Muhwava *et al.,* 2007). The analysis of in- and out-migration in the Africa Centre Demographic Surveillance Area (DSA) using data from 2000 to 2006, indicates that total in-migrations rates for both males and females remained relatively the same from 2000 to 2006. On the other hand, females had lower out-migration rates than males. In this study, an out-migrant was defined as "a person originally listed on a DSS round as a resident, or a person who became a resident after the round by birth or immigration, who subsequently moved out of the surveillance (DSS) area permanently" (Muhwava and Nyirenda, 2007: 16).

Household structures in South Africa are changing with more and more households becoming female headed. As a result more females are being pushed into the labour market to earn money to care for their families (Casale and Posel, 2002; Posel and Casale, 2003). Studies using 1995 and 1999 October Household Survey (OHS) provide evidence which show an increase in female headed households over the years by approximately 21 per cent, from 28 per cent to 34 per cent in 1995 and 1999 respectively (Casale and Posel, 2002). Although the results should be reported with caution due to data problems such as underreporting, Statistics South Africa undertook an analysis using the 2001 South Africa census and found that less than 43 per cent of all 2.2 million households in KwaZulu-Natal were headed by females in the age groups of 15 to 34 years (Statistics South Africa, 2006a). In rural KwaZulu-Natal there is evidence in the ACIDS that less than 40 per cent of the houses are headed by females and that the number of female headed houses have been increasing over the years by 20 per cent, from 29.3 per cent in 2000 to 35.2 per cent in 2006 (Muhwava and Nyirenda, 2007).

According to Posel and Casale (2006), freedom to move can also be attributed to rural household structures which allow for other members of the household to take care of the children thus allowing females to move. Ardington *et al.* (2007) argue that in South African households, the presence of pension payments increase the probability of such household having female migrants. In relation to this, the study using longitudinal data of the ACDIS also found that grandmothers in the households do not only receive pensions but are also able to provide care and support when the female moves (Ardington *et al.*, 2007). Camlin (2008), analysing sex differences in determining migration in rural KwaZulu-Natal also conclude that "the presence of older females in rural households may play a role in facilitating the migration of working-age females in South Africa" (Camlin, 2008: 104).

Male migration has also triggered female migration. Initially in South Africa most rural households relied on remittances from male labour migrants for survival in addition to other sources such as farming. This is currently changing. Posel and Casale (2003a) argue that lack of or very low remittances or reduced potential of other income sources automatically push females to move and look for earnings. High levels of unemployment have meant that female's receipts of males remittances is reduced and as a result females try to venture into the job market which leads to them moving. The October Household

Survey (OHS) carried out by Statistics South Africa commenced in 1993 and was conducted until 1999 with the purpose of collecting detailed information about the South African labour market and its participants (Yu, 2007). An analysis of recent labour trends in South Africa using the 1995 and 1999 OHS indicates that the percentage of households with at least one employed male for females aged between 15 and 65 has decreased by approximately 17 per cent, from 53 per cent in 1995 to 44 per cent in 1999 (Casale and Posel, 2002).

2.5 Selectivity concept of migration

The selectivity concept of migration is important in explaining why certain individuals in a certain place migrate while others do not (Farber and Lee, 1984; Reniers, 1999). Economic theories of migration are still limited in trying to explain this phenomenon (Massey *et al.*, 1993). Farber and Lee (1984) argue that certain individuals in a society are expected to migrate more than others due to differences in age, marital status, sex or educational attainment. Reniers (1999) argues that to claim that migrants are better educated or have higher educational attainment, for instance than the non-migrants in a place of origin, might be misguided since both better educated and non educated individuals are equally propelled to migrate. It also depends on where the migration flows originate from, that is, a rural or urban area. Migrants are usually a heterogeneous group meaning that individuals who come from an urban area will be better educated, and ones who come from a rural place of origin will be less educated. This means that other factors apart from educational attainment instigate a move, and not educational attainment alone. It might be that both the highly and lowly educated are responding to pull factors in the place of destination and push factors at the place of origin. As a result, both highly educated and lowly educated both end up being selected (Reniers, 1999).

Glick (2010) in discussing immigrant families, states that selectivity of migration is a non-random process that determines which individuals will migrate and which ones will not. In terms of fertility, migrant and non-migrant females have different fertility levels from the onset since both of these groups have different preferences for family size. In addition, migrants and non-migrants have different demographic attributes such as age and marital status that directly affect fertility. As a result, migrants are selected from the onset and end up having small family sizes as compared to non-migrants in the parent population. However this does not mean that females with low fertility are more likely to

migrate than females with high fertility or vice versa. The disruption hypothesis states that once migration has occurred, such migrants will not have high fertility or the fertility levels that are exhibited at the place of origin (Farber and Lee 1984; Johnson and Keppel, 1986; Lee, 1992).

2.6 Demographic determinants of female migration

This section will discuss the related literature of how demographic factors of migration can influence the decision to migrate by either encouraging or inhibiting female migration prospects. The demographic determinants of female migration include parity, childbearing status such as pregnancy, age at the time of migration, and marital status. Family formation patterns such as timing of marriage and family union will also be discussed as determinants of female migration.

2.6.1 Effect of parity on migration decisions

The three ways commonly used to explain the fertility differentials between migrants and non-migrants are selection, disruption and adaptation (Lee, 1992). The selection hypothesis states that from the onset, migrant and non-migrant females have different fertility levels because of certain demographic and socio-economic traits such as educational attainment, marital status and occupational status. For instance, migrant females may have delayed engagement of first union due to longer durations in pursuit of educational opportunities and this may lead to having fewer children as compared to non-migrant females (Bongaarts *et al.*, 1984). This concept is further explained by Farber and Lee (1984) who state that migrants and non-migrants "may have very different preferences regarding family size. The fact that they migrate to urban areas where families are smaller than rural areas and where child costs may be higher could reflect these preferences" (Farber and Lee, 1984: 340).

The disruption hypothesis on the other hand states that migrants usually exhibit lower fertility levels as compared to non-migrants in the rural areas "due to disruptive factors associated with the migration process" (Lee, 1992: 1417). These disruptive factors include postponing engaging in childbearing prospects until the couple moves to the destination, or waiting until the couple has settled well into the new environment, usually an urban area (Manner, 2003). According to Goldstein and Goldstein (1983) and Lee (1992), since the disruption hypothesis mainly applies to immediate fertility prospects,

once females have settled into the urban areas, their fertility patterns may again be accelerated to the levels - exhibited in the rural areas.

The final hypothesis is adaptation, which states that migrant females may be exhibiting lower fertility levels than non-migrants since they adapt to fertility behaviours that already exist in the destination or urban areas (Farber and Lee, 1984). The adaptation effect states that "rural-urban migrants face a new environment in their place of residence and this environment provides distinctly different prices for a number of interrelated life-cycles consumption-investment choices. These include the rewards to females for labor market participation outside the family, the opportunity cost of fertility and the chance for children to receive healthcare and housing" (Lee, 1992: 1417).

A number of studies (Goldstein and Tirasawat, 1977 cited in Lee, 1992; Johnson and Keppel, 1986; Mhloyi, 1987 cited in Brockerhoff and Eu, 1993; Manner, 2003) indicate that the number of births a female has affects the decision to migrate. Brockerhoff and Eu (1993), analysing Demographic Health Surveys (DHS) data from seven sub-Saharan African countries (Burundi, Ghana, Senegal, Nigeria, Kenya, Togo and Sudan) from 1986 to 1990, found that rural females with two or more children are not likely to migrate. However, rural females with only one child may engage in migration the hypothesis being that the presence of many young children inhibits female migration. The study uses multinomial logit analysis to evaluate the effect of fertility on migration by considering births that occurred five years prior to the survey (Brockerhoff and Eu, 1993). An additional study interviewing United States wives concluded that fertility neither encourages nor impedes internal female migration in females of childbearing age, namely 35 years and below. Cross-sectional data analysis was used to establish the effect of fertility on migration by considering the number of children a female had in the rural areas before, and after migrating into the urban areas (Johnson and Keppel, 1986).

Although in some circumstances females in the rural areas with few a number of children may be motivated to migrate since they are not constrained by having to look after many children and it may be less costly to move (Manner, 2003). This however, is not usually the case. Due to the selectivity hypothesis, it is generally expected that from the onset, non-migrant females in rural areas will have higher fertility than females migrating into urban areas (Farber and Lee, 1984; Johnson and Keppel, 1986; Lee, 1992). This is

confirmed by Mhloyi (1987, cited in Brockerhoff and Eu, 1993) who argues that most societies in rural areas still value high fertility and thus females with low fertility may not easily migrate into urban areas because they would want to have the number of children or family size desired by the clan. Furthermore, Johnson and Keppel (1986) argue that it may be advantageous and cheaper for individuals to rear a large family in rural places compared to urban areas and as a result, females who have many children may not be motivated to migrate.

2.6.2 Pregnancy and migration decisions

Migration occurs in all populations and as such pregnant females are also a mobile group (Hodgson *et al.*, 2009). The western setting such as Fell *et al.* (2004) study done in urban and rural areas of Canadian provinces of Novia Scotia and Eastern Ontario provides evidence that pregnant females also move short distances. Dolk (1997) in addition to Fell *et al.* (2004), found slightly marked differences in the proportion of pregnant females who migrate. Dolk (1997) found pregnant females moving throughout pregnancy to be 23 per cent. These results are twice as high compared to Fell *et al.* (2004) whose case-control study analysing possible environmental exposure factors during maternal mobility found that 12 per cent of the control group (398 cases) moved throughout pregnancy. The percentage of females who move during pregnancy are estimated by considering the duration between the first day of a hospital prenatal appointment booking and the delivery date (Hodgson *et al.*, 2009). It is also important to have knowledge on changes in residency throughout the pregnancy, that is, physical residential address during the time of conception, hospital prenatal appointment bookings, and time of delivery. This assists in tracking movements on specific dates (Fell *et al.*, 2004).

Hodgson *et al.* (2009) carried out in north of England, using multivariable logistic regression to analyse factors influencing maternal mobility, found mobility during pregnancy to be approximately 11 per cent. This is slightly lower compared to the study by Fell *et al.* (2004). If a female changed physical residential address more than once during pregnancy, the individual was classified as a “mover” (Fell *et al.*, 2004). It is important to note that the Hodgson *et al.* (2009) study did not take the residential address at the time of conception into consideration in addition to physical residential address at time of hospital prenatal appointment bookings and time of delivery. Moves made prior to hospital bookings were not considered. This could be partly attributed to the fact that

physical residential addresses at the time of conception may be subjected to recall error. While this may be a limitation the study still offers insight on moves made during 60 per cent of the duration of pregnancy (Hodgson *et al.*, 2009).

Studies in the western setting have also investigated at what stages females are more likely to move by analysing movements during different pregnancy trimesters. By using the delivery date as a reference point, studies can construct the start of the first trimester to be the period between the date of conception and 90 days, the second semester to fall between 91 to 181 days, and the third semester to be 182 days to approximately 270 days (Lupo *et al.*, 2010). A study conducted by Fell *et al.* (2004) found mobility among pregnant females to be higher in the second and third trimester of pregnancy, that is, 9 per cent of 398 case-control subjects, as compared to the first trimester, which reflected 3 percent mobility in the same number of case-control subjects. Other studies found that the proportion of pregnant females migrating in their last two trimesters to be 19 per cent (Dolk, 1997). Lupo *et al.* (2010) found different results from Fell *et al.* (2004). According to them pregnant females are more likely to move in their first trimester as compared to both the second and third trimester. During the first trimester, part of the reason pregnant females attend clinics is to undergo prenatal screening for birth defects. Lupo *et al.* (2010) suggest that if a pregnant female goes to a health facility during the first trimester and a birth defect is detected, she is likely to move during that trimester rather than in the second and third trimesters.

According to Boyle *et al.* (1998), the environment in which a pregnant female resides in affects migration decisions by encouraging movement, especially if the family is living in an overcrowded unit or sharing a house. Other suggestions as to why pregnant females move have been put forward. Pregnant females especially in the rural areas move to seek antenatal care since health facilities are usually far away or located in urban areas (Lupo *et al.*, 2010). Myer and Harrison (2003), undertaking a qualitative research in rural KwaZulu-Natal on reasons why pregnant females seek antenatal care late in their pregnancies, found that out of all the females interviewed, less than 40 per cent had close proximity access to antenatal clinics. More than 60 per cent made residential moves from their households to areas where the clinics are located either by taxi or walking. Myer and Harrison's (2003) study should be treated with caution since the sample size was too small for the results to be representative of pregnant females moving from a rural setting

to access antenatal care. The study by Hodgson *et al.* (2009) also attributed pregnant females' moves to seeking antenatal health care facilities or moving to be near family members.

As a pregnancy progresses into an advanced stage, the prospects of migrating decrease. Females in the rural areas who are about to give birth or have just given birth may not easily migrate because the process would be physically and psychologically challenging (Goldstein and Tirasawat, 1977 cited in Lee, 1992). In addition "many pregnant females do not even attempt to reach a facility for delivery since walking many kilometers is difficult in labour and impossible if labour starts at night, and transport means are often unavailable" (Gabrysch and Campbell, 2009: 46).

However after giving birth, scholars such as Boyle *et al.* are of the opinion that the female may move since "the birth of a child is still one of the most important causes of local migration" (Boyle *et al.*, 1998: 119). Clark and Withers (2009) confirm that the birth of a child may trigger a female's move to seek better housing conditions. Furthermore, an additional child in a rural family would prompt a female to seek the help of immediate relatives to care for the newborn baby. If these relatives are already in an urban area, a female may be inclined to move there and try to secure a job to take care of the now expanded family (Brockerhoff and Eu, 1993). Analysing the relationship between fertility, mobility and participation in the labour force, Clark and Withers (2009) argue that residential movements due to the birth of a child are related to other factors such as labour force participation. In some instances, both the female and the husband may have to move to look for work since both their incomes are vital in raising the expanded family (Clark and Withers, 2009).

2.6.3 Migration and family formation patterns

Many studies that demonstrate the relationship between female migration and family formation patterns are based on the western setting (Creighton *et al.*, 2009; Hauan, 1996; Landale and Lindstrom and Saucedo, 2007; White and Potter, 2008). Female migration may affect family formation patterns through preferred family size, timing of marriage union, premarital childbearing patterns, or types of family structures such as single headed or two-headed families. Since migration affects family size preferences, a migrant family who may ordinarily have preferred to have many children before migration usually

ends up having fewer children at the destination (Landale and Hauan, 1996). Lindstrom and Saucedo (2002), investigating the effect of migration on Mexican females' fertility, concluded that migrant females at the destination usually have small families and fewer total births. As a result, migration has a suppressing effect on the short and long term fertility patterns of migrant females at their destinations. Lindstrom and Saucedo (2007) argue that females from sending regions who eventually want to have large families are not likely to migrate.

Female migration can deter or postpone immediate childbirth prospects, and thus affect family formation patterns through the timing of a birth. A detailed study by Lindstrom and Saucedo (2007) seeking to show how migration prospects from Mexico to the United States are affected by family lifecycles, concluded that an additional birth and birth order play a crucial role in affecting a female's migration decisions. The study established that the first birth is a decisive factor in whether a Mexican female will migrate to the United States, since a female has a higher chance of migrating in the same year as the year of the first birth. If the female has additional births and has not yet migrated to the United States, the chances are significantly reduced. In other words, first birth increases migration prospects. The timing of the first birth in relation to family formation patterns is related to the fact that most migrant females going to the United States may want to start and complete childbearing early and begin working in their destination as soon as possible (Lindstrom and Saucedo, 2007). Other studies find the contrary and concluded that families of couples already in Mexico who have had a first birth are not likely to migrate (Lindstrom and Saucedo, 2002).

The number of males who migrate is also expected to affect family formation patterns by delaying marriage, thus affecting union formation patterns by upsetting the local marriage market (White and Potter, 2008). Scholars such as Manner (2003) argue that the delay of forming a family can also take the form of postponing engagement in childbearing prospects until the couple moves to the destination or waits to settle well into the new environment. Lee (1992) explains that family formation during the period of migration can also be halted due to the disruption hypothesis of migration and fertility. This postponement is only expected to be temporary and once a female has settled into the urban area, the fertility patterns again may be accelerated to the levels exhibited in the rural area (Goldstein and Goldstein, 1983). White and Potter's (2008) investigation into

fertility patterns for females in sending countries such as Mexico, concluded that marriage plays a major role in migration decisions in that households experiencing international migration have fewer numbers of females staying in a family union.

Although marriage may affect the exposure to risk of bearing a child and the commencement of a family union, this is not always the case (White and Potter, 2008). Migration also affects family formation patterns through premarital childbearing patterns. Landale and Hauan's (1996) study sought to establish whether first or second generation Mexican migrant females to the United States mainland are at higher risk of bearing children outside of marriage. The findings were that migratory females to the United States were at higher risk of premarital childbearing, unlike the females back in Mexico. As a result they end up forming single-headed families. This has been attributed to females engaging in sexual behaviour at an early age and often doing so before being engaged in a marriage union. Furthermore, second-migration females to the United States mainland were also less likely to enter marital unions, unlike their counterparts in the sending region (Landale and Hauan, 1996).

Other studies have investigated the relationships between family formation, children education possibilities, and migration (Creighton *et al.*, 2009). Migration affects family formation patterns by increasing the prevalence of single-headed families, cohabiting formations, two-headed families, and even divorced families. Studies in Mexico seeking to establish whether migration shapes family structures just as separations or divorce would, found that the absence of the migrant partner has an impact on a child's development. This not only increases single-headed families but also children's education prospects. The study concluded that children from households where the father is a migrant are very likely to have low levels of education or to drop out of high school (Creighton *et al.*, 2009).

2.6.4 Effect of age on migration decisions

Most scholars agree that age is a determining factor in whether females migrate or not. Females in young age groups, that is 20-24 and 25-29 years, engage in female migration unlike their older counterparts of 30-34, 35-40, 40-44 and 45-49 years who remain behind (Brockerhoff and Eu, 1993). This is not surprising since females in younger age groups are likely to migrate in search of jobs, to relocate jobs or to be with a spouse. According

to Sandefur and Scott (1981), as age increases, migration prospects tend to decrease. This inverse relationship between age and migration is partly due to lifecycle changes such as marital and career status. For instance attaining work experience in a career is dependent on age. Job promotion in some careers may mean upward mobility and normally entails moving or relocating to other places (Sandefur and Scott, 1981). On the other hand, scholars propose a contrary argument that younger females are expected to migrate more in comparison to their older counterparts, and this has to be factored in migration studies (Lancaster, 1990).

In South Africa, most migrant females are in the 25-29 age group (Kok *et al.*, 2003). The ACDIS being a DSS which tracks localised populations over a period of time with the intention of collecting vital demographic information such as births, deaths and migration, also provides evidence of age being a demographic factor determining migration (INDEPTH Network, 2002). In rural KwaZulu-Natal the females who migrate internally within the Demographic Surveillance Area (DSA) are also in the younger age groups, that is 20-24 and 25-29 years. Females below the age of 25 are also highly mobile (Camlin, 2008). These patterns of movement can be attributed to the fact that females of younger ages are moving into the labour market seeking jobs and earnings. Analysing the ACDIS longitudinal data for the year 2000 to 2007, indicates that females below 30 years were likely to in-migrate into the DSA (Muhwava *et al.*, 2010).

2.6.5 Effect of female marital status on migration decisions

Marital status can be grouped into categories that include never married, currently married and cohabiting, formerly married (divorced and separated). One way of establishing whether never married or married females migrate more often, is by asking the question of marital status to individuals and then counting the frequency of never married and married. This is what usually happens in migration analyses which use cross-sectional data. Unfortunately cross-sectional data in this type of migration analysis is limiting (Sandefur and Scott, 1981) because it is not a clear presentation of knowing which of the two categories is more likely to migrate. Odland and Shumway (1993) argue that event history method of migration analysis supported by longitudinal data gives a better analysis, as this type of analysis considers the timing of both marital and migration events by providing dates for both of these events. This allows for tracking the exact duration in which an individual moved from one state to another, i.e. from never married to married.

However, scholars rarely have the pleasure of coming into contact with reliable accurate longitudinal data and as a result most resort to using cross-sectional data (Kok *et al.*, 2003).

The transition from the state of never married to married is made possible by marriage. This being the case, marriage is one of the reasons why females migrate since they are in most cases expected to move into the husband's home (Boehm, 2004). Furthermore, marriage being a major event in the life of an individual, the timing of a migration event date is likely to happen in close proximity to the date when a change in marital status occurred, that is, from never married to married (Odland and Shumway, 1993). Current debate deals with exploring the possibility of considering marital status at the time of enumeration rather than at the time when a move is made. While this may be partly addressed by the use of longitudinal data as it tracks migrants and their demographic characteristics over time (Kok *et al.*, 2003), it has the drawback of missing out previous marital status, more specifically the marital status at the time of the move.

In a study undertaken using Demographic Health Surveys (DHS) from eight sub-Saharan Africa countries studies, Brockerhoff and Eu (1993) found that there was no clear cut between the two states; both married and never married females are in most cases equally propelled to move or not. Never married females usually migrate to the urban areas to look for work and married ones do so to join their husbands. This does however not automatically mean that married females are more mobile than never married females. Depending on the length of marriage, the married move less than never married females. A possible explanation is that the start of a family or the beginning of a marriage union usually means the presence of additional members over time, and the cost of moving all household members may increase and thus deter migratory prospects (Sandefur and Scott, 1981).

Migration for marriage purposes is also not uncommon in a country such as South Africa. Stichter (1985) asserts that since communities in South Africa are also patriarchal in nature, it is usually expected that once bride wealth has been paid, the female leaves her family and marries into the man's house. Studies confirm this phenomenon. According to Crush *et al.* (2005), females currently migrating are usually never married and more likely to migrate than married females. These findings are consistent with the evidence

provided in an article by Rogan *et al.* (2008). Rural to rural and rural to urban migration in KwaZulu-Natal also indicate that migrants are usually never married. Using the 1996 South Africa census, it was found that approximately 70 per cent of all migrant labour workers in KwaZulu-Natal were never married whereas married labour migrants constituted only 20 percent (Rogan *et al.*, 2008).

Posel and Casale (2003a) suggest that the increase in female migration has occurred concurrently with a decline in marital rates for Black females in South Africa. This could mean that females are having more freedom of movement without restrictions from males in their households. There is evidence of decline in marital rates in rural KwaZulu-Natal between 2000 and 2006 in data generated by ACDIS which reflect that the proportion of ever married gradually declined. By 2006, close to two thirds of the females in the ACDIS had never been married (Hosegood *et al.*, 2009). In connection with this, Posel and Casale (2003a) explain that "if men restrict the mobility of women, then it is expected that women are more likely to migrate if they are not married and do not live with men not only because there may be a greater need for women to look for work but also because women have more freedom to move" (Posel and Casale, 2003a: 7).

By analysing the 2000 to 2007 ACDIS longitudinal data, marital status, specifically never married, was associated with in-migration into the DSA (Muhwava *et al.*, 2010). Building on this, Gubhaju and De Jong (2009) also found that between never married and married females in rural areas, the latter least intended to migrate to urban areas. The reasons cited included the fact that rural married females were less likely to be labour migrants (Posel, 2003). In addition, such females may face mobility constraint perhaps due to having to take care of family members, unlike never married females in the rural areas who are not tied down by this responsibility. Intention to migrate is one way of measuring future migration prospects. De Jong and Steinmetz (2006) define migration intentions by asking individuals questions such as "do you plan to move out of the origin and settle permanently into the destination (a rural or urban area) within the next 12 months?" and "do you plan to move out of the place of origin to seek employment or for other reasons to another destination then relocate back to this place of origin?" The origin in this case was where an individual was currently based and the destination the place of temporary or permanent settlement (De Jong and Steinmetz, 2006).

2.7 Socio-economic determinants of female migration

This section will discuss the related literature which deals with how socio-economic factors of migration might influence the decision to migrate by either encouraging or inhibiting female migration prospects. The socio-economic determinants of female migration that will be discussed include educational attainment and labour force participation.

2.7.1 Effect of educational attainment on migration decisions

This section will discuss whether an individual's level of educational attainment increases the risk of migrating. Educational attainment has been cited as one of the factors which determine female migration which means that females in rural areas with higher educational attainment are more likely to migrate (Donato, 1993). Few migration studies have analysed the effect of single years of education on migration although education levels were used in some studies. Educational levels are usually categorised into no education, primary, secondary and higher level education, with all these categories having different effects on migration decisions at the time of migration (Gould, 1982).

Generally, most of the literature provides evidence that educated females (with secondary and higher levels of educational attainment) in rural areas migrate to urban areas more than ones with primary education only (Barnum and Sabot, 1976; Brockerhoff and Eu, 1993). Studies conducted by Kok *et al.*, (2003) looking at internal migrants from Eastern Cape to Limpopo in South Africa confirmed that individuals with primary educational attainment are less likely to migrate than ones with secondary or higher educational attainment. An analysis of the national representative survey data by Rogan *et al.* (2008) who investigated the characteristics of internal KwaZulu-Natal migrant workers, also concluded that not only were these migrant workers female but they were often educated. This study defined a migrant worker as an individual who had moved from one geographical area such as an informal settlement, ward or suburb, to another between 2000 and 2005. Posel and Casale (2006), also utilising cross-sectional household surveys such as the 1999 OHS to analyse the characteristics of migrant workers between 1993 and 2002, found that rural African migrant workers are more educated than non- migrants. The 2000 to 2007 ACDIS longitudinal data demonstrates that higher levels of education were associated with out-migrating the DSA (Muhwava *et al.*, 2010).

Opinions differ on the reasons why educated females in rural places migrate to urban areas. Brockerhoff and Eu (1993) states that educated females are very likely to migrate from rural to urban areas since they are more exposed to information that enlightens them on the benefits of moving, such as the fact that urban areas offer more economic opportunities than rural areas. Some scholars such as Donato (1993) state that females with higher education may perceive the need to increase career opportunities and move to another area especially if they feel that they cannot attain it from where they are currently situated. "The educated, whether as a consequence of literacy or because of a wider circle of contacts, may have better knowledge of urban labour market conditions. As a result, an educated rural resident may appear to be more responsive than an uneducated rural resident to a given spatial structure of economic opportunities" (Barnum and Sabot, 1976: 31). This knowledge of the urban labour structure may mean that the educated are more aware that a certain level of education increases the chances of getting a better job in an urban area (Gould, 1982). Micro-economic theories of migration also indicate that individuals in rural areas normally migrate to urban areas to increase earnings or with the intention of getting better jobs. The possibility of attaining these prospects increases with the individual's level of education and as a result, could explain why it is not uncommon that educated individuals in rural areas migrate more than the less educated. In addition, Gould (1982) argues that "education reinforces the importance of rural/urban income differentials as the primary cause for rural urban migration" (Gould, 1982: 106).

The relationship between education levels, urban wages and migration is significant in analysing the effect of education levels on migration decisions (Gelderblom, 2007). However, Barnum and Sabot (1976) explain the difficulty of analysing the relationship between education and migration:

> A significant association between regional average educational levels and migration rates is not sufficient to confirm that the educated have a higher propensity to move to town than the uneducated. The relationship may be due to a relatively higher level of mobility among all members of the regional population, educated and uneducated alike, suggesting that education is serving as a proxy for an unspecified independent variable with which it is highly correlated. Even if it is established independently that the educated have a higher migration propensity there is no way to determine whether it is due predominately to a higher level of

> responsiveness to a given rural urban expected income differential or to wider income differentials for the educated than the uneducated. (Barnum and Sabot, 1976: 33)

2.7.2 Effect of the labour force participation on females' migration decisions

In terms of female participation in the labour force, labour force structural changes experienced over the years, a female's income, and the types of skills she possesses, are some of the factors which affect migration. Casale and Posel (2002) argue that structural changes affect female labour demand by creating spaces for more females to enter the labour force, but that this was not the case in South Africa. The authors reflecting on past data and trends in female labour force participation state that "the period 1995 to 1999 has been characterized by relatively little net growth in labour demand" (Casale and Posel, 2002: 17). However, not all sectors experienced this phenomenon. There has been an increase in skilled labour demand in sectors such as finance which implies that females with such skills may migrate in search of better opportunities (Burger, 2004 cited in Gelderblom, 2007). According to Casale (2004), an analysis of trends in labour participation between 1995 and 2001 found that the skilled sector is mainly comprised of White females, with this sector offering approximately 100,000 additional jobs in managerial and professional posts.

The informal sector in South Africa however has also been growing, which has resulted in more females are being lured into informal employment especially since the chances of obtaining regular formal employment is restricted (Casale and Posel, 2002). According to Casale (2004), utilising the analysis of labour trends in South Africa from 1995 to 2001, Black African females employed in the informal sector increased from 6 per cent in 1995 to approximately 21 per cent in 2001. Statistics South Africa using both the 2004 September Labour Force Survey and the 2001 South Africa census, found that in KwaZulu-Natal province, the informal sector had more Black females compared to Black males, with females representing approximately 41 per cent compared to Black males with 27 per cent in the same sector (Statistics South Africa, 2006a). However, comparison between formal and informal sectors indicate that the formal sector employed two-thirds of Black females unlike the informal sector which had close to 41 per cent of Black females in KwaZulu-Natal (Statistics South Africa, 2006a). These results have to be interpreted with caution since there may have been an overestimate or underestimate of individuals who reported

that they were employed in the 2001 South Africa census (Statistics South Africa, 2006a). Any individual who had worked for pay or family gain one week prior to the census was considered to be employed. This included all those who were on leave during this time period (Statistics South Africa, 2006a).

Further perception of female migration decisions can be understood by exploring the relationships between structural changes in the labour force, level of education, income, and migration (Gelderblom, 2007). For instance, low paying jobs are usually associated with low levels of education or none at all. Females with low incomes are not likely to migrate because they may not be able to incur the cost associated with migration such as transportation cost. On the other hand, females with high incomes are more likely to migrate because they would be in a position to finance the move (Gelderblom, 2007). However the situation of income and education can change before and after migration and as a result "it is impossible to make any causal connection between income/education and the decision to engage in either migration or labour migration" (Gelderblom, 2007: 244). Moreover lack of adequate longitudinal data usually makes it difficult to measure the effect of income on migration since a female's income before and after migration needs to be established for such analysis (Kok *et al.*, 2003). Nevertheless, Gelderblom (2007) proposes that a relationship between income, migration, and education exists. Evidence is provided by Kok *et al.* (2003) who investigated female labour using the 1996 South African census. Females earning between R3 000 and R13 500 were more likely to be migrants who changed residence and not the ones migrating to look for jobs, whereas females earning less than R3 000 were likely to migrate but with the sole intention of searching for new or better employment opportunities (Kok *et al.* , 2003).

2.8 Conclusion

Migration from homelands to urban areas used to be restricted and controlled by movement acts and laws but currently in South Africa there is evidence to show that not only are females migrating but that female migration is also on the increase (Posel and Casale, 2006). This has been made possible by the abandonment of movement acts and social reasons such as females having more freedom to move and search for better economic opportunities. This chapter has demonstrated that demographic characteristics are additional factors that can explain female migration decisions. Parity, age, marital status, educational attainment and female participation in the labour force, were analysed

as possible determinants of female migration. Demographic determinants including age and parity influence females' migration decisions. Although most of the literature dealing with demographic factors was based on the western setting, it still provided a guide to how these factors influence female migration decisions. Age is certainly a factor, the conclusion being that females in younger age groups are more mobile and migratory. The total number of births a female has ever given birth to also affects migration decisions (Johnson and Keppel, 1986). Females in rural areas with additional births over time are less likely to migrate to urban areas. Pregnancy was also concluded to affect migration decisions. Females who are in advanced stages of pregnancy are not likely to move. Educational attainment and marital status were additional influences. Literature seems to suggest that educated females in the rural areas are more likely to move since such females are exposed to the knowledge that urban areas may offer better economic prospects than rural areas.

Chapter Three
Research Methodology

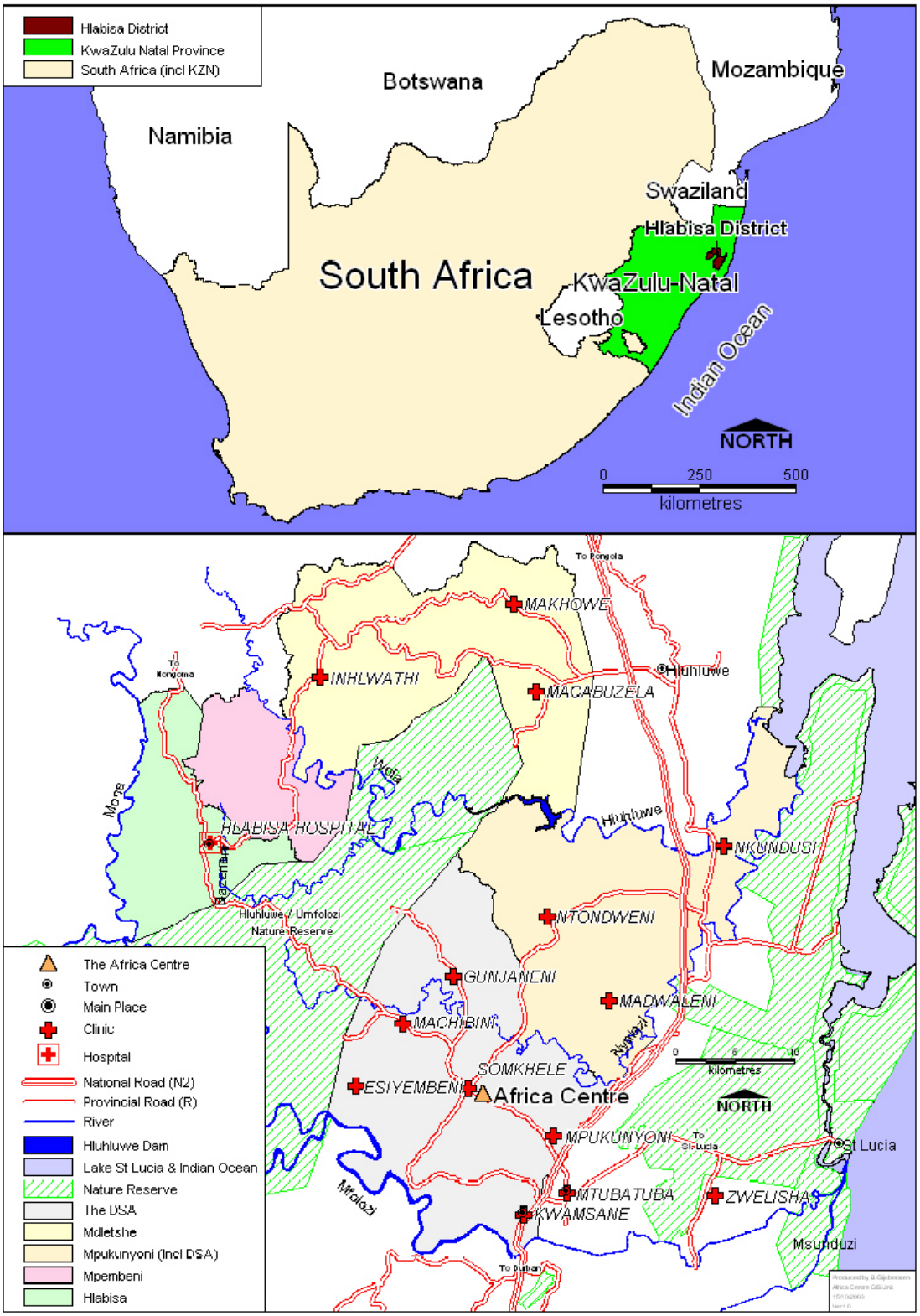
3.1 Introduction

This study is based on data collected and prepared by the Africa Centre for Health and Population Studies which does surveillance commonly known as Africa Centre DSS (Demographic Surveillance System). The institution also participates in the INDEPTH DSS network. DSS data is a system that allows a local designated population to be tracked over a period of time with the sole purpose of obtaining demographic information such as births, deaths, health status and migratory patterns. A Demographic Surveillance Area (DSA) is the geographical area covered by the DSS. The longitudinal nature of the DSS data emerges from the fact that the local population, be it individuals or households are followed up on from time to time with vital events such as migration being recorded and updated (INDEPTH Network, 2002). This chapter provides an introduction of the DSA and how migration is defined in the ACDIS. It also provides the demographic and socio-economic variables that are known to be predictors of female migration. These include the number of children ever born to females (parity), childbearing status such as pregnancy and breastfeeding, reported age, marital status, and educational attainment. Thereafter the chapter will present the data analysis procedures.

3.2 Description of the study area

Figure 3.1 below is a map showing the location of the Africa Centre Demographic Surveillance Area (DSA) and its surroundings. The DSA is located in the KwaZulu-Natal province approximately 220 kilometers north of Durban, under the Mtubatuba Municipality since April 2011. It covers close to 12,000 households and is intended to follow people confined in one geographical area over time with the "aim to establish an accurate and exhaustive record of the total population in that area" (Muhwava *et al.*, 2007: 5). The DSA is mainly rural with the presence of a township and informal settlements. The DSA is also characterised with rural Zulu homesteads having access to infrastructure, piped water or toilet facilities. Most economic activities include farming and forestry (Muhwava, 2007). ACDIS keeps track of demographic components including births. The total fertility rate of the ACDIS has been steadily declining by 48 per cent, from 4.70 per cent in 2000 to 2.43 in 2004 (Muhwava and Nyirenda, 2007).

Figure 3.1 Location of the Africa Centre Demographic Surveillance Area (DSA)



Source: Muhwava *et al.* (2007).

3.3 Data source

This study uses the ACDIS data for the period 1 January 2001 to 1 April 2008. The ACDIS started in 1998 although data collection only began in 2000 and has been running till date. Trained Africa Centre data collectors are sent to the field to collect data from individuals and households on vital events such as births, deaths, and migration, every six months, after which it is updated (Muhwava *et al.*, 2007). Up until 2003 the data used to be updated three times, and not only twice per year (Muhwava *et al.*, 2007). Data quality control entails cross-checking for errors, coverage, consistency and accuracy of the information collected from households. It also involves having trained fieldworkers skilled in matters relating to the ACDIS such as surveillance, interviewing skills, and operating procedures (Muhwava *et al.*, 2007). Quality control minimises errors such as double- and under-counting. The dates when individuals in-migrate and out-migrate from the DSA are recorded in the migration notification form, which is then linked to individual and household information.

3.4 Data requirements

The study attempts to answer the following research questions:

1) What are some of the demographic and socio-economic factors affecting female migration in rural KwaZulu-Natal?

2) Is female migration associated with particular stages around childbirth, controlling for known determinants of migration?

The main research question of this study involves understanding the determinants of female migration. Data that provides information on distribution of migrant and non-migrant females by covariates such as marital status is needed to answer this question as is data that provides the length of time spent in the DSA prior to the migration move. The study period ranged from 1 January 2001 to 1 April 2008, thus the dates at which females migrated between these two periods are required. The second research question examines whether female migration is associated with particular stages around childbirth, controlling for known determinants of migration. The known determinants of migration in the ACDIS include age, educational attainment, marital and socio-economic status, in addition to place of residence and type of household (Muhwava *et al.*, 2010).

Additional data was utilised to provide knowledge of the number of migrant and non-migrant females in different childbearing statuses including none (females who were not pregnant or breastfeeding during the study period), pregnancy, breastfeeding and multiple (females who were both pregnant and breastfeeding during the study period). The ACDIS keeps a record of birth delivery dates for the study period and these dates will be used to calculate the date of conception by subtracting nine months from the birth delivery dates. This dataset will assist in answering the second research question. Since most datasets elsewhere usually do not have these events (birth and migration) simultaneously, the ACDIS offers an opportunity to undertake this research.

3.5 Household socio-economic round (HSE)

The Africa Centre for Health and Population Studies also carries out a survey entitled the Household Socio-economic round (HSE). This survey provides information on marital status and educational attainment for each respondent. The HSE can be collected once-off. The first HSE was called HSE1 and the second one HSE2. HSE1 was undertaken between February and September 2001 and HSE2 between January 2003 to mid 2004 (Muhwava *et al.,* 2007). Since the HSE round is not conducted annually, it is expected that there will still be an acceptable number of missing values for various covariates. This will apply to covariates that are collected during the HSE round, specifically educational attainment and marital status. For instance, the educational status for each respondent was not captured in the first HSE1 round conducted in 2001.

One way of dealing with missing values for educational attainment covariates is by considering the female's educational attainment in the next HSE round undertaken in 2003. In other words, educational attainment information collected in 2001 will be used. If educational attainment for 2001 is missing, then the information for 2003 will be used. Marital status information nearest to 2002 will be used, for instance, even in cases where the marital status is several years away from 2002 - as will happen for migrant and non-migrant females first registered in the ACDIS in 2007. The justification for this is that since these covariates remain relatively the same over the observation period, it is safe to assume that if educational attainment and marital status was not captured in HSE1, the information for HSE2 can be used. It is also possible that a female's educational attainment and marital employment status for females aged 20 and above will be missing

for both HSE1 and HSE2. In this case, it will be categorised in a separate group labeled "missing".

3.6 Selection of determinants of female migration

The Africa Centre ACDIS datasets has demographic and socio-economic variables of each respondent and all these are of interest to the study.

3.6.1 Dependent variables

The study has two dependent variables namely, whether an individual migrated, and the timing of this migration. The Africa Centre Demographic Surveillance Area (DSA) uses bounded structures as the focal point of data analysis. These are defined as "a building or a group of buildings, on land belonging to a single person or organization" (Africa Centre, 2008: 20). Migration in the ACDIS is defined as any change in residency, that is, any individual who changes a place of residence is considered a migrant. The criteria used to distinguish between a resident and a non-resident include the opinion of the individual or other household members; time spent in the bounded structure; and movements made into or out of the bounded structure (Muhwava *et al.*, 2007). An individual in the ACDIS becomes a resident by staying in a bonded structure. Residency is also the time spent living in a bonded structure, or rather, physical presence (INDEPTH Network, 2002; Muhwava *et al.*, 2007). According to Muhwava and Nyirenda (2007) referring to the ACDIS, a resident is an individual who would have spent most nights in a bounded structure. A non-resident is an individual who does not usually reside in the structure but is considered a household member.

For this study, a migrant is defined a person who out-migrated from the DSA. Females are followed up on for a specified period of time to see whether they experience an event or not, that is, migration. Females who out-migrated from the DSA between 1 January 2001 and 1 April 2008 and never came back by the end of this period are considered to be migrants. All the rest are referred to as non-migrants. STATA statistical computer software used for quantitative analysis will be used to identify females who migrated and females who did not during the specified period. Females who migrate will be coded 1 and will be referred to as migrant females. Females who did not migrate will be referred to as non-migrant females and will be coded 0.

The timing of migration is also a dependent variable in this study. The study uses data between 1 January 2001 and 1 April 2008. This period is referred to as the study period and will be defined in months. Timing of the migration variable will be undertaken to understand the length of time female migrants were resident in the DSA before they migrated. Timing is also influenced and differs according to independent variables including parity, childbearing status (none, pregnant, breastfeeding, multiple), reported age, marital status, and educational attainment. The timing used for independent variables under consideration was fixed. There is a bias associated with this as some statuses had changed by the time of migration. Although this has limitations, the bias is considered minimal since South African fertility is characterised by lengthy birth spacing (Moultrie and Timæus, 2002).

3.6.2 Independent variables

The independent variables, which are demographic and socio-economic in nature, include the total number of children a female has ever given birth to (parity at 2001), childbearing status between 1 January 2001 and 1 April 2008, age at 2001, marital status at 2002, and educational attainment between 2001 and 2003. Independent variables attempt to analyse the first research question which looks at the determinants of female migration. This variable, especially the childbearing status, addresses the second research question which looks at whether stages around childbearing such as pregnancy and breastfeeding are associated with female migration.

3.6.2.1 Parity

Parity is the total number of children a woman has ever given birth to at 2001. This independent variable will be used to establish whether it is a determinant of female migration. The study is also interested in demographic factors affecting the likelihood to migrate. The justification for including parity as an independent variable is the fact that the literature seems to suggest that the number of children females have either encourages or inhibits female migration (Brockerhoff and Eu, 1993; Lindstrom and Saucedo, 2002; Manner, 2003). Each respondent is asked by a field worker about the number of live births they have had. Parity is self-reported and coded as a continuous variable. In this study for the regression and survival analysis, a more conventional coding system will be adopted and parity will be coded as a categorical variable. The subsequent formulated

hypothesis for this variable is whether the number of children ever born to a female increases the risk of migrating.

3.6.2.2 Childbearing status

Childbearing status in this study means stages around childbirth such as pregnancy and breastfeeding. This variable is important in answering the second research question which attempts to answer whether female migration is associated with particular stages around childbirth while controlling for known determinants of migration. The justification for selecting this independent variable includes the fact that few studies in the Africa Centre DSA have looked at the relationship between childbearing status and migration prospects. In addition, the study is keen to assess the stages of childbearing when females are likely to be at risk of migrating. This variable is not directly present in the ACDIS datasets but was created for this study by using birth delivery dates between 1 January 2001 and 1 April 2008, and migration dates during the same period. By using these birth delivery dates as a reference point, it is possible to construct the start of the first trimester to be the period between dates of conception to 90 days, the second trimester to fall between 91 to 181 days and the third trimester to be 182 to approximately 270 days (Lupo *et al.*, 2010).

However, in this study, the date of conception rather than the birth delivery date will be the reference point. The duration between the date of conception and the delivery date is assumed to be nine months (270 days). In other words, this independent variable will be used to analyse the length of time spent in the DSA prior to the migration move after the date of conception. For instance, if females migrate five months after the date of conception, it will be concluded that they are more likely to migrate during pregnancy, since five months (150 days) is less than 270 days. If females migrated fifteen months after the date of conception, it will be concluded that they are more likely to migrate during breastfeeding, since fifteen months (450 days) is more than 270 days. Childbearing status is further categorised into four groups which include none, pregnancy, breastfeeding, and multiple. None is for females who are not pregnant or breastfeeding. The pregnancy category is created by subtracting nine months from a female's birth delivery date. The breastfeeding is created by adding one year to the birth delivery date, assuming that breastfeeding takes up to one year and the multiple category caters for females who are pregnant and breastfeeding at the same time. Cross tabulations will be

done to establish the relationship between the dependent variable and the childbearing status variable to see for instance, the percentage of breastfeeding females who migrated.

3.6.2.3 Age

The hypothesis associated with this independent variable includes finding out at which ages females are more likely to migrate. Age at 2001 is an important independent variable in this study for two reasons. First, the study is interested in females who are in their reproductive years for the purposes of analysing whether childbearing status such as pregnancy and breastfeeding are predictors of female migration. Only females who have started or are in their reproductive ages are able to provide such information. Reproductive ages range between 15 to 49 years. This means that females who are below 15 years or above 49 years will be omitted from the study. The literature seems to suggest that age is related to migration since the latter tends to occur at certain ages which are concurrent with other events in an individual's life, and this may encourage migration. For instance, at a certain age, an individual may have a career that may force them to move. In addition, younger females in the age groups, 15-19 and 20-24 are more likely to migrate compared to their older counterparts. This variable will also seek to answer the first research question which seeks to understand the determinants of female migration. In addition, a study by Muhwava *et al.* (2010) also found age to be a known determinant of female migration in the DSA and this study will try to confirm these findings. In the ACDIS, age is self- reported.

3.6.2.4 Marital status

Given that marital rates are on the decline in South Africa, it is important to include this variable in the study to see the effect of marital status on the probability of migrating. Marital status at 2002 is an independent variable which the ACDIS collects by asking respondents about their status. In order to recognise the different dynamics of marital status in the DSA, the ACDIS has coded marital status to include different types of marital status such as traditionally married, formally married, polygamy, and single. However, this study will adopt conventional categories for marital status which include never married, currently married, cohabiting, and formerly married. Never married females include females who have never married, and single females. The justification behind combining currently married and cohabiting females into one group is that in South Africa, both of these two groups tend to have similar reproductive traits (Maharaj

and Cleland, 2006). Formerly married females include divorced and separated females. This independent variable will also address the first research question which looks at the determinants of female migration.

3.6.2.5 Educational attainment

Studies have shown that educational attainment is an important factor affecting migration. The justification for including educational attainment between 2001 and 2003 is because the literature suggests that females in rural areas who are highly educated are expected to migrate more than ones who are not. The study is interested in seeing whether educated females are more likely to migrate than females who are not educated. This variable will be used to examine its effect on the probability of migrating. Educational attainment is self-reported by each respondent and written on a form by the field worker.

3.7 Research methodology

The research design is quantitative. According to Bryman (1984) the advantages of quantitative analysis are varied including the fact that objectivity is maintained since the researcher does not engage directly with the subjects of the study. The ACDIS covers close to 90,000 individuals (Muhwava *et al.*, 2007). This study seeks to make generalisations from the findings of a large sample size and as a result, a quantitative approach rather than a qualitative approach is best suited for data analysis. In addition, the study is also interested in the descriptive statistics of females who migrated (migrants) and females who did not migrate (non-migrants) by demographic and socio-economic variables thus the need for a quantitative analysis.

3.8 Research methods

This section presents the various quantitative methods that will be used to analyse data and include cross tabulations, chi square tests, logistic regression models, and the Cox Proportional Hazard model. Quantitative data from the ACDIS from 1 January 2001 to 1 April 2008 is analysed. The ACDIS datasets have dates on which females migrated during the study period. STATA computer statistical software, which is frequently used to analyse quantitative data, will be used. Cross tabulations will be used to show demographic and socioeconomic differentials between females who migrated (migrants) and females who did not migrate (non-migrants). A chi square test will be used to

understand the relationship and the statistical association between dependent and independent variables.

3.8.1 Determinants of female migration

Factors associated with female migration are estimated using logistic regression. This analysis will examine the effect of different independent variables on the probability to migrate. Logistic regression is preferred for this analysis since the dependent variable is dichotomised, that is, can only take two possibilities, (0=did not migrate) and (1=migrated). The probability that females will migrate is presented by the following logit model which has extra parameters as shown with the formula below:

$$\log[(p_{i,t})/(1-p_{i,t})] = \alpha + \beta x + y`Z_{i,t} + \varepsilon_i$$

where $\log[(p_{i,t})/(1-p_{i,t})]$ is the probability of migrating. Odds ratios are similar to probabilities of an event occurring or not. The further the odds ratios from zero, the lesser the probability of migrating. In order to know the effect of each independent variable in isolation on the probability of migrating, a bivariate analysis will be carried out. Each independent variable will have categories plus a reference category. The odds ratios of each category will be reported in relation to the reference category which has a value of one. For instance, the odds ratio of females with one, two, three or four children and above will be interpreted in relation to the reference group (females with no children). After the bivariate analysis, the study will undertake a multivariate analysis which will seek to show the effect of all the independent variables on females' migration decisions. This will be achieved by performing multiple regressions in order to identify the key factors contributing to variations in female migration.

3.8.2 Determinants of timing of female migration

The main analysis used in this study is one that will allow for observation of females and will follow them up until they migrate. The duration for following up on females ranges between 1 January 2001 and 1 April 2008. During this period, not all females will migrate. Some will migrate and these females will be said to have experienced the event (migration) whereas the ones who will not have experienced the event or migrated will be said to have failed the event. This method which observes females until they experience

an event at a particular time is called the survival analysis method. Experiencing an event is commonly also known as failure or failing. Survival analysis allows for analysis of time to an event where the event can be any social experience such as a birth or a death. For instance, this study uses survival analysis to model the timing of female migration. Time is an important variable for this study since it provides the time during which females were at risk of experiencing an event. Females who experienced the event (migrated) will be coded 1 and females who did not experience the event (did not migrate) will be coded 0. The length of time in this study will be defined in months. Survival analysis will attempt to address the second research question which seeks to assess whether female migration is associated with particular stages of childbirth such as pregnancy or breastfeeding. Survival analysis will be used to analyse the probability that females will migrate at a particular time given that they are at risk of migrating.

Given that the females are followed from one point in time (start of observation) to another (end of observation), it is important to note and consider that during this period, not all females in the study will have failed or experienced the migration event. Such consideration in survival analysis is commonly known as censoring (Klein and Moeschberge, 1997). All females who will not have migrated by the end of the observation will be censored. Before the study addresses which females will be censored, it is important to discuss the females who will be included in the study. A selection criterion of residency and age will be used as a deciding factor. This means that not all females of all ages are going to be included in the study. In addition, not all females present in the DSA will be included in the study since some are residents while others are non-residents. All females included in the study will have to be of particular ages and they must be residents in the DSA.

Since the purpose of a Demographic Surveillance System (DSS) is to follow up on and have more knowledge of residents living in a geographical designated location over time, it is best to distinguish residents from non-residents. This study is interested only in resident females. The justification for this is that the ACDIS has no records of past fertility and migration history for non-resident females migrating into the DSA. In addition, “only the resident population is ‘at risk’ of having demographic events in the surveillance area, for example births or deaths” (Hosegood *et al.*, 2005: 47). As a result there is no relevant information for non-resident females migrating into the DSA, and

their migration patterns prior to moving into ACDIS cannot be accounted for (Hosegood and Timæus, 2005).

The second selection criterion for females who will be considered in this study is age. One of the research questions aims to address the timing of migration and different childbearing status such as pregnancy and breastfeeding. Given that females between 15 and 49 years are in their reproductive careers, this limits reproduction to these ages in order to analyse migration and childbearing status. Females below 15 years are assumed not to have started their reproductive careers and females above 49 years have passed their reproductive ages. In other words, not all females in the DSA will be included in the study. The following are the eligibility criteria for the study:

1. All resident females in the DSA aged 15 to 49 years on 1 January 2001.
2. All resident females who turn 15 years between 1 January 2001 and 1 April 2008.
3. All females who become resident between 1 January 2001 and 1 April 2008 and are between the ages of 15 and 49 years between 1 January 2001 and 1 April 2008.

All the above females are considered eligible for this study and are followed over time to check how long it took them to migrate. Although all these females are at risk of experiencing the event, not all will. As a result, it is important to censor some cases. According to Gutierrez (2002) survival analysis allows for censorship (females who can no longer be observed after the study period). Ignoring this fact will lead to biased results. Fixed-right censoring occurs at a fixed start date at the start of the observation on 1 January 2001 at 15 years of age. All these observations are censored at the start of observation. Censoring also happens at a fixed end date at the end of observation which is 1 April 2008, with all females who will not have migrated at the end of the observation period. All females who turn 50 years or die during the observation period exit the study.

3.8.2.1 Kaplan-Meier estimator

In the survival analysis, the Kaplan-Meier estimator is used to estimate the probability of migrating at any given time, that is, the probability of failure times. It also takes into account the probability of not migrating and projects these probabilities in increasing order over time. By taking into account the probabilities of failing from an increasing to a decreasing order, a survival curve is formed at points where failure takes place. The survival curve is calculated and expressed in the formula below

$$S(\chi) = \prod_{\{y=0,\chi-1)} p_y = \prod_{\{y=0.\chi-1)} (1 - q_y)$$

where p_y is the probability of not failing or not migrating between t_0 and t_1 and is also equivalent to $(1 - q_y)$. The Kaplan-Meier estimator will be applied to each independent variable and Kaplan-Meier curves for each independent variable will also be presented.

3.8.2.2 Cox Proportional Hazard Model

Once the Kaplan-Meier estimator has been run on all the independent variables, a multivariate analysis using the Cox Proportional Hazard model will be done to model the risk of migrating between 1 January 2001 and 1 April 2008. The Cox Proportional Hazard model links the relationship between variables and survivorship which is done with the use of a mathematical model. The Cox Proportional Hazard model is a semi-parametric model since it does not require the baseline hazard $h_o(t)$. The advantage of this model is that it allows for modelling failing time while taking into account other variables. In addition, the shape of the hazard function is a factor that best fits the data considered in this study. The Cox Proportional Hazard model is presented in the form of hazard ratios through the hazard function. Hazard ratios describe the effect of the variables on survival time whereas the hazard function describes the risk of migrating over the period of time when females are at the risk of migrating. The advantage of the Cox Proportional Hazard model is that it allows for censoring given the fact that not all females will migrate, and allocates an equal chance of migrating to all females. It also accommodates dichotomous and categorical variables (Blossfeld *et al.*, 1989) and can also be used to report hazard ratios. Hazard ratios will determine the effects of demographic and socio-economic covariates on survival time. A lower hazard ratio means high survivorship thus longer time spent in the DSA before migrating. The Cox Proportional Hazard model estimates risk of migrating and coefficients presented in the formula below

$$h_i(t)/h_o(t) = \exp(\beta`(x_i-x_j))$$

where $h_o(t)$ is the baseline hazard at time t; $h_i(t)/h_o(t)$ is the ratio of the hazards at time t and $\beta`(x)$ are regression parameters estimated by Cox regression.

3.9 Limitations of the study

The study uses the ACDIS analysis which studies a population in a defined geographical area, but not all females in the DSA will be eligible for inclusion in the analysis. While the study is looking at female migration, it does not deal with females of all ages but has restricted females' ages from 15 to 49 years. This means that generalisibility of findings might be compromised since the study is only interested in females in their reproductive or childbearing ages. Secondly, the study will only be looking at out-migrations, the justification being that the ACDIS has no records of past fertility and migration history for non-resident females migrating into the DSA. In addition, "only the resident population is 'at risk' of having demographic events in the surveillance area, for example births or deaths" (Hosegood *et al.*, 2005: 47). As a result there is no relevant information for non-resident females migrating into the DSA, which means their migration patterns prior to moving into ACDIS cannot be accounted for (Hosegood and Timæus, 2005). The study uses longitudinal data, one drawback of which is that there is loss of information when females drop out of the study or die during the observation period (Frees, 2004). This is minimised by censoring such females.

3.10 Conclusion

This chapter looked at the research methodology and methods that will be applied in the study. It also presented the dependent and independent variables of the study where the dependent variables were migration and timing of migration. Females who out-migrated from the DSA and never came back are referred to as migrants and females who did not out out-migrate from the DSA are referred to as non-migrants. The independent variables of the study are childbearing status (none, pregnancy, breastfeeding and multiple), the total number of children a female has ever given birth to (parity), reported age, marital status and educational attainment.

Chapter Four

Demographic and Socio-economic Determinants of Female Migration

4.1 Introduction

This chapter will present the results of the study differentials and determinants of female migration. Cross tabulations will be used to show demographic and socioeconomic differentials. The Chi-square test will be used to examine the relationship and statistical association between covariates. Later the focus will be on multivariate analysis which will seek to show the effect of all the explanatory covariates on females' migration decisions. Multiple regressions will be used to identify the key factors contributing to variations in female migration. A table of the results will be presented.

4.2 Distribution of migrant and non-migrant females

This section gives a background of females who migrated (migrant females) and females who did not migrate (non-migrant females) by different distribution of covariates. This includes the total number of children a female has ever given birth to (parity at 2001), reported age at 2001, marital status at 2002, and educational attainment between 2001 and 2003. Table 4.1 below gives this outlook. Of the 34 807 females, 9643 migrated which represents 28 per cent. This supports the view that this is a highly mobile population as indicated by studies done on the DSA (Hosegood *et al.*, 2005; Muhwava *et al.*, 2010). This is important to note given the fact that populations, including South Africans, do not move much. The historic nature of South Africa meant that the Black African population's movements were curtailed and limited by movement acts during the apartheid period. Black populations were forced to live in homelands and not allowed to settle permanently in urban areas (Butler *et al.*, 1977; Thompson, 2000; Walker, 1990; Wentzel and Tlabela, 2006). The literature supports the fact that even in the post-apartheid era, South Africans generally do not move much. According to Statistics South Africa (2006), in the census analysis during the period between 1996 and 2001, less than 13 per cent of South Africans engaged in inter-provincial migration. Table 4.1 below illustrates that 25 164 females did not migrate between 2001 and 2008.

Table 4.1 Demographic and socioeconomic distribution of migrants

Characteristics	Migrant percentages	Non-migrant percentages
Parity at 2001		
0	5337 (*55.35)	10382 (*41.26)
1	1881 (*19.51)	4812 (*19.12)
2	975 (*10.11)	3094 (*12.30)
3	581 (*6.03)	2115 (*8.40)
4 plus	869 (*9.01)	4761 (*18.92)
N	**9643**	**25164**
Age group at 2001		
15-19	4103 (*42.55)	8099 (*32.18)
20-24	1968 (*20.41)	4598 (*18.27)
25-29	1421 (*14.64)	3570 (*14.19)
30-34	920 (*9.54)	2874 (*11.42)
35-39	617 (*6.40)	2232 (*8.87)
40-44	445 (*4.61)	2094 (*8.32)
45-49	178 (*1.85)	1697 (*6.74)
N	**9643**	**25164**
Marital status at 2002		
Never married	8054 (*84.33)	18255 (*75.52)
Currently married & cohabiting	1333 (*13.96)	5020 (*20.77)
Formerly married	164 (*1.72)	897 (*3.71)
N	**9551**	**24172**
Educational attainment between 2001 and 2003		
No education	718 (*9.89)	3138 (*15.13)
Primary education	2164 (*29.79)	7847 (*37.82)
Secondary education	4078 (*56.15)	9132 (*44.02)
Higher education	303 (*4.17)	630 (*3.04)
N	**7263**	**20747**

Source: Africa Centre for Health and Population Studies Demographic Surveillance System (DSS), 2001-2008

*Significant: $p<0.001$

The difference in numbers of children ever born to females (parity) between migrant and non-migrant females does not appear to be very marked. For instance, 19.51 per cent of migrant females had only one child, whereas 19.12 per cent of non-migrant females had the same number. The percentage of migrant and non-migrant females with children also seems to be decreasing. Perhaps this should not come as a surprise since studies in South Africa by Moultrie and Timæus (2003) using 1996 South Africa census data and the 1998 South Africa Demographic Health Survey, show that Black African fertility in South

Africa between the 1960s and 1996 to be 3.5 children per woman. It is also important to note that 6.03 per cent of migrant females had three children and 8.40 per cent of migrant females had the same number. 9.01 per cent had four children and above. This is twice the percentage of females who had the same number of children for non-migrant females (18.92 per cent).

19.51 per cent of all the females who migrated had one child whereas 9 per cent of all the females who migrated had four children and above. It can also be safely assumed that females with high parities may represent older females. These types of females are generally not likely to migrate compared to young females (Sandefur and Scott, 1981). For instance, non-migrant females with four children and above are most likely to be older females. The percentage of non-migrant females with three children is 8.40 per cent. It is interesting to note that 10 382 non-migrant females had no children (41.26 per cent). The percentage of migrant females without children is higher than the ones with more children; this might suggest that females with no children are more likely to migrate more than females with many children.

Almost 43 per cent of migrant females were between 15 and 19 years whereas less than two per cent were in the 45-49 age group. Migrant females in the 20-24 age category comprised of 20.41 per cent. Perhaps the reasons for this are schooling and seeking employment opportunities. There is no marked difference between the percentage of migrant and non-migrant females in the 20-24 age group (20.41 and 18.27 per cent respectively). Younger females being more likely to migrate compared to older females, might explain these results. Studies in rural KwaZulu-Natal also show that females below the age of 25 are highly mobile (Muhwava and Nyirenda, 2007). Having this in mind, it is no surprise that migrant females in the 45-49 age group form the smallest percentage (1.85 per cent). Non-migrant females in the 30-34 and 35-39 age groups represent 11.42 and 8.87 per cent respectively. In the South African context, the relationship between age, employment and migration can explain these figures.

13.96 per cent of migrant females (females who migrated) were currently married and cohabiting whereas 84.33 per cent were never married. The justification for combining currently married and cohabiting females into one group is that in South Africa, both of these groups tend to have similar reproductive traits (Maharaj and Cleland, 2006). 20.77

per cent of females who did not migrate were currently married and cohabiting. All migrant and non-migrant females who were separated, divorced or widowed, were also combined into one group (formerly married). 1.72 per cent of formerly married females migrated.

The highest observed percentage in the educational attainment covariate for both migrant and non-migrant females is high school education, which is 56.15 and 44.02 per cent respectively. Most South Africans over 20 years had attained high school education during the period between 1996 and 2001, whereas 8.4 per cent have had higher education (Statistics South Africa, 2005). 9.89 per cent and 15.3 per cent of migrant and non-migrant females respectively did not have any education. Low levels of educational attainment decreases an individual's chances of getting employment especially in the formal sector since educational attainment is highly correlated with employment in South Africa (Bhorat and Leibbrandt, 2001). Such a situation may explain why females with no education may not necessarily migrate more than educated ones. 4.17 per cent of migrant females had higher levels of education. As stated above, educational attainment and employment in South African are highly correlated, thus females with higher levels of education are more likely to migrate compared to ones without.

4.3 Independent effects of demographic and socio-economic determinants on the probability of migrating

Table 4.2 below presents the effects of chosen covariates on the probability of migrating. The covariates include the total number of births a female has ever given birth to (parity at 2001), age at 2001, marital status at 2002, and educational attainment between 2001 and 2003. The effect of migrating by parity will be analysed and compared against a reference group, which is females without children. The effect of age on probability to migrate will be compared with the reference age group, which is 15-19 years. Categories of marital status will be compared with never married. The reference group for educational attainment is no education.

Table 4.2 Odds ratios of migrating by demographic and socio-economic covariates

Characteristics	Odds ratio
Parity at 2001	
0 (ref)	1
1	*0.7038
2	*0.6394
3	*0.6063
4 plus	*0.4968
Age group at 2001	
15-19 (ref)	1
20-24	*0.6925
25-29	*0.6460
30-34	*0.5831
35-39	*0.5937
40-44	*0.4914
45-49	*0.2234
Marital status at 2002	
Never married (ref)	1
Currently married and cohabiting	*0.6873
Formerly married	*0.5903
Educational attainment between 2001 and 2003	
No education (ref)	1
Primary education	*1.1123
Secondary education	*1.5255
Higher education	*1.6157

Source: Africa Center for Health and Population Studies Demographic Surveillance System (DSS), 2001-2008

Ref=Reference category; *Significant: p<0.001

Females with one child have a 30 per cent less chance of migrating compared to females without children. Females with two children have a 37 per cent less chance of migrating compared to females without children. This relationship is significant and supports studies done in sub-Saharan African countries which conclude that females with two children and above are less likely to migrate (Brockerhoff and Eu, 1993). Females with three children have a 40 per cent less chance of migrating compared to females without children. Females with four children and above have a 51 per cent less chance of migrating compared to females with no children. This is supported by the literature which argues that having many children inhibits migration prospects (Manner, 2003). This trend might also be connected to age. Females with high parities tend to be in the older age groups 40-44 and 45-49 years, since they are approaching the end of their reproductive

careers. The literature by Sandefur and Scott (1981) points out that age is a determinant of female migration and older females are less likely to migrate compared to young ones.

Table 4.2 illustrates that the age group 20-24 have a 31 per cent less chance of migrating compared to the 15-19 age group. Moving out of the DSA for schooling purposes or seeking employment might be the reasons for this (Muhwava *et al.*, 2010). Ages 30-34 have a 42 per cent less chance of migrating compared to the 15-19 age group. Job seeking might be a factor influencing migratory moves; the informal sector in South Africa has been experiencing an increased demand for labour (Casale and Posel, 2004). Evidence by Casale (2004) shows that for the period between 1995 and 2001, Black African females represented twice the percentage of migrant labour compared to Black African males in the same sector. Females aged 45-49 years have a 78 per cent less chance of migrating compared to females of 15-19 years.

Currently married and cohabiting females have a 32 per cent less chance of migrating compared to never married females. The presence or commencement of a family might be the reason for this. While the literature points out that both single and married females are likely to migrate (Rogan *et al.*, 2008), the prospects of migrating for currently married and cohabiting females may take a different turn in South Africa where marital rates have been declining over the years (Casale and Posel, 2002; Posel and Casale, 2003). If this is the case, more females who fall under the marital category of never married might be likely to migrate than the currently married and cohabiting ones. On the other hand, some literature suggests that married females are more likely to move compared to never married females (Gubhaju and De Jong, 2009). Formerly married females have a 41 per cent less chance of migrating compared to never married females. Crush *et al.* (2005) conclude that widowed females are more likely to migrate than married females. Lack of the presence of a spouse might be the reason for this happening.

Females with primary educational attainment have an 11 per cent higher chance of migrating compared to females without education. Currently in South Africa, educational attainment is highly pegged for increasing one's chances of attaining employment especially in the formal sector (Bhorat and Leibbrandt, 2001; Rospabe and Mlatsheni, 2002). Females with higher educational attainment have a 61 per cent higher chance of migrating compared to ones without education. The fact that education and the chances of

employment are highly correlated in South Africa might explain why females with higher educational attainment have a 61 per cent higher chance of migrating compared to ones without education. This seems to be in contrast with a country such as Mexico where the females who migrate are the uneducated rather than the educated (Donato, 1993). Studies in South Africa (Posel and Casale, 2006; Kok *et al.*, 2003, Muhwava *et al.*, 2010) also support the hypothesis that females in rural areas with higher educational attainment are more likely to migrate to urban areas rather than the ones with no educational attainment.

4.4 Results of logistic regression of determinants of female migration

This section discusses the different multivariate analysis models while controlling for different independent covariates. It seeks to show the key covariates that influence female migration. Odds ratios are reported. Table 4.3 below shows the key covariate of interest, parity and the effect it has on the probability of migrating while controlling for other covariates. The Bayesian Information Criteria (BIC) which measures how well predictors are doing in describing a model or the goodness of fit of a model, seems to improve across the models, that is from 80498.4 (model 1) to 67622.8 (model 3). According to the STATA Manual (2003), a low BIC measure is always preferred and usually means that the predictors are doing a good job in describing the model. Nested models are ones that allow for comparability between odds ratios. In addition, since the models are nested, one can compare changes in model fit across models. BIC measure seems to reduce each time another covariate is added into the model. In model 3, by looking at the BIC measure, the fit of the model has improved. This means that these specific covariates have a high explanatory power in predicting the probability of female migration.

Model 1 in Table 4.3 illustrates that when age is added and controlled, the effect of migrating by number of children ever born to females (parity) on the probability to migrate, seems to have reduced. Females with one child now have a 19 per cent less chance of migrating compared to females with no children. This relationship is significant. The effect of parity on the probability to migrate decreased from 0.7038 (bivariate analysis) to 0.8130 (multivariate analysis). This might suggest that age is also a key determinant in predicting female migration since it is by adding age in the model that

Table 4.3 Logistic regression of determinants of female migration (odds ratios presented)

	Model 1	Model 2	Model 3
BIC	80498.4	79232.2	67622.8
BIC observations	65013	63875	67508.1
N	34807	34807	33723
Log likelihood	-40188	-39542	-33702
Parity at 2001			
0 (ref)	1	1	1
1	*0.8130	*0.7938	*0.8313
2	*0.7881	*0.7727	*0.8780
3	*0.7831	*0.7735	0.9187
4 plus	*0.7066	*0.6994	*0.8805
Age group at 2001			
15-19 (ref)	1	1	1
20-24	*0.7704	*0.7300	*0.5948
25-29	*0.7665	*0.7301	*0.5492
30-34	*0.7271	*0.6906	*0.5053
35-39	*0.7655	*0.7239	*0.5373
40-44	*0.6388	*0.6029	*0.4403
45-49	*0.2895	*0.2718	*0.1904
Marital status at 2002			
Never married (ref)		1	1
Currently married and cohabiting		0.9833	1.0272
Formerly married		1.0876	*1.2014
Educational attainment between 2001 and 2003			
No education (ref)			1
Primary education			*0.7503
Secondary education			*1.1281
Higher education			*1.5962

Source: Africa Center for Health and Population Studies Demographic Surveillance System (DSS), 2001-2008

Ref=Reference category; *Significant: * $p<0.05$

the effect of parity on probability to migrate was caused to decrease by 16 per cent. Some of the explanatory power of the model was indeed hidden by age covariate. While females with two children have a 37 per cent less chance of migrating compared to females with no children in the bivariate analysis, they now have a 22 per cent less chance of migrating compared to females with no children. The effect of parity on probability to migrate decreased by 30 per cent from 0.6063 (bivariate analysis) to 0.7831 (multivariate analysis). Females with high parities, that is four children and above, have a 70 per cent less chance of migrating compared to females with no children. This supports

the literature that females with high parities are less likely to move compared to ones with zero parity (Manner, 2003).

Model 2 introduces the marital status covariate. It controls for this covariate and age as one analyses the effect of different parities on the probability to migrate. The effect of the number of children ever born to females (parity) on probability to migrate is reduced in comparison to the effect of parity on probability to migrate in the bivariate analysis in Table 4.2. This might mean that there is a relationship between parity and marital status. In addition, the BIC measure further reduces by 2 per cent and this shows that model 2 has a better explanatory power than model 1 in predicting variations in female migration. It also implies that marital status is a key demographic factor in predicting female migration. Females with one child have a 21 per cent less chance of migrating compared to females with no children. Marital status has been introduced into the model and commencement of the family might be the reason why females with one child are not migrating.

The South African context might be different given that marital rates are on the decline (Posel and Casale, 2003a). Studies in the West argue that the timing of the first birth and commencement of a family influence migration decisions. Lindstrom and Saucedo (2007) hypothesise that migrant females from Mexico coming into the United States might want to start a family and hope to begin work soon enough once they reach the destination. It is interesting to note that in model 2, when controlling for parity and age, the marital status is not significant. While currently married and cohabiting females have a 2 per cent less chance of migrating compared to never married females, formerly married females have an 8 per cent higher chance of migrating compared to never married females. The fact that formerly married females now have a higher chance of migrating is due to the fact that both parity and age were controlled for in the multivariate model.

Model 3 controls for number of children ever born to females (parity), age, marital status and educational attainment. Model 3 might be described as the best model out of the three since it has the lowest BIC value. In other words, the model is doing a good job in predicting female migration. Furthermore, in comparison with model 1 and model 2, the BIC measure is further reduced by 15 per cent, from 79260.9 (model 2) to 67622.8 (model 3). Whereas females with one child had a 19 per cent less chance of migrating

compared to females without children in model 1, these females now have a 12 per cent less chance of migrating compared to females without children. Predictors are doing a good job in predicting female migration since the farther the effect is from 0, the stronger the effect in predicting female migration. Females with four children and above have a 12 per cent less chance of migrating compared to females without children. One of the reasons why females with high parities are less likely to migrate is because they may have many young children who would inhibit migration prospects (Manner, 2003).

By introducing educational attainment, the effect of parity on probability to migrate is further reduced in comparison to effect of parity on probability to migrate in the bivariate analysis. Educational attainment and employment are highly correlated in the South Africa context (Bhorat and Leibbrandt, 2001; Rospabe and Mlatsheni, 2002). By controlling for parity, age and marital status, females with high school educational attainment have a 12 per cent higher chance of migrating compared to females without education. However, it must be noted that the educational attainment covariate has some missing categories and this might very well have affected the effect of educational attainment on probability to migrate. Despite this fact, the result is also consistent with the studies done in the DSA context. Muhwava *et al.* (2010) also found that individuals with high school educational attainment are more likely to out-migrate the DSA compared to those without education.

4.5 Distribution of childbearing status covariate

The following section seeks to answer the second research question of the study namely whether female migration is associated with particular stages of childbirth controlling for known determinants of migration. The none category is for females who are neither pregnant nor breastfeeding during the period between 1 January 2001 and 1 April 2008, and multiple status caters for females who are both pregnant and breastfeeding during the period between 1 January 2001 and 1st April 2008. The study acknowledges the fact that a female can be in both the pregnancy and breastfeeding status. The pregnant category is for females who were pregnant between 1 January 2001 and 1 April 2008 and the breastfeeding category for females who were breastfeeding between 1 January 2001 and 1 April 2008. Table 4.4 below shows the distribution of migrant and non-migrant females at various stages of childbearing, namely pregnancy, breastfeeding and multiple statuses.

Table 4.4 Distribution of female migrants by childbearing status

Characteristics	Migrant percentages	Non-migrant percentages
Childbearing status between 1 January 2001 and 1 April 2008*		
None	8028 (*83.25)	17650 (*70.14)
Pregnant	657 (*6.81)	3047 (*12.11)
Breastfeeding	950 (*9.85)	4342 (*17.25)
Multiple	8 (*0.08)	125 (*0.05)
N	**9643**	**25164**

Source: Africa Center for Health and Population Studies Demographic Surveillance System DSS, 2001-2008

*Significant: $p<0.001$

83 per cent of female migrants were not pregnant or breastfeeding during the period between 1 January 2001 and 1 April 2008. On the other hand, 6.81 per cent of female migrants were pregnant between 1 January 2001 and 1 April 2008. This is twice the number of non-female migrants in the same category and supports the literature that claims pregnant females also migrate depending on the stage of the pregnancy (Boyle *et al.*, 1998; Hodgson *et al.*, 2009). This percentage also contradicts the hypothesis that pregnant females are not likely to migrate. Less than 10 per cent of migrant and non-migrant females were breastfeeding between 1 January 2001 and 1 April 2008. Breastfeeding females might be able to migrate due to two factors. The first is that they have already given birth and have thus passed the advanced stage of pregnancy which might have inhibited them from moving. Second, the literature argues that such females may move especially if support and care of the baby through immediate relatives is located somewhere else (Brockerhoff and Eu, 1993). Less than 1 per cent of migrant females were both pregnant and breastfeeding between 1 January 2001 and 1 April 2008. Perhaps this is mostly affected by the small distribution number of female migrants in this status.

4.6 Effect of childbearing status covariate on the probability to migrate

Table 4.5 below shows the effect of various childbearing statuses on the probability to migrate. Pregnant females had a 37 per cent less chance of migrating compared to females who were not pregnant or breastfeeding (none category). This contradicts literature in the western setting which states that pregnant females like any other population are likely to migrate (Hodgson *et al.*, 2009). Breastfeeding females have a 48 per cent less chance of migrating compared to females in the none category.

Table 4.5 Odds of migrating by childbearing status

Characteristics	Odds ratio
Childbearing status between 1 January 2001 and 1 April 2008*	
None	1
Pregnant	*0.6368
Breastfeeding	*0.5223
Multiple	*0.3940

Source: Africa Centre for Health and Population Studies
Demographic Surveillance System (DSS), 2001-2008
*Significant: p<0.001

This finding also contradicts the literature which states that breastfeeding females are able to migrate depending on the stage of breastfeeding. According to Dettwyler (1995) weaning can start after six months. If females are in the weaning stage, other household members can provide support. In the South African context, it is not surprising to have females, more so teenage females, giving birth and leaving the baby in the care of the grandmother.

This is contrary to the study by Kaufman *et al.* (2003), who argue that in most cases there is no support offered and such teenagers have to stay behind and look after the child. It may be that their study is not representative of the South African context or that the females in the study were not observed over long enough a period to see whether they received additional support from other household members at a later stage. Females who are both pregnant and breastfeeding have a 61 per cent less chance of migrating compared to females who are not pregnant or breastfeeding. This might be attributed to the fact that such females are tied down by the breastfeeding responsibility while also preparing to have another baby.

4.7 Results of logistic regression of determinants of female migration (odds ratios of childbearing status covariate included in the model)

This section uses nested models to check the effect of childbearing status between 1 January 2001 and 1 April 2008 on its own against and also controlling for other covariates such as parity at 2001, age at 2001, marital status at 2002 and educational attainment between 2001 and 2003. Table 4.6 below presents nested models. Nested models allow

Table 4.6 Logistic regression of determinants of female migration (odds ratios presented)

	Model 1	Model 2	Model 3	Model 4
BIC	79762.2	79075.7	77587.1	66306.2
BIC observations	65013	65013	63875	54744
N	34807	34807	33723	28010
Log likelihood	-39837	-39460	-38705	-33049
Childbearing status between 1 January 2001 and 1 April 2008				
None (ref)	1	1	1	1
Pregnant	*0.6280	*0.5684	*0.5339	*0.5527
Breastfeeding	*0.5347	*0.4760	*0.4495	*0.4524
Multiple	*0.3954	*0.3482	*0.3271	*0.3319
Parity at 2001				
0 (ref)	1	1	1	1
1	*0.7487	*0.9103	*0.8881	*0.9086
2	*0.6759	*0.9230	*0.9052	1.0090
3	*0.6261	0.9549	0.9401	*1.0983
4 plus	*0.4899	*0.9150	*0.8970	*1.1298
Age group at 2001				
15-19 (ref)		1	1	1
20-24		*0.7654	*0.7135	*0.5773
25-29		*0.7082	*0.6532	*0.4888
30-34		*0.6247	*0.5661	*0.4147
35-39		*0.5852	*0.5219	*0.3864
40-44		*0.4205	*0.3706	*0.2718
45-49		*0.1798	*0.1575	*0.1106
Marital status at 2002				
Never married (ref)			1	1
Currently married and cohabiting			*1.0825	*1.1275
Formerly married			1.0468	*1.1624
Educational attainment between 2001 and 2003				
No education (ref)				1
Primary education				*0.7559
Secondary education				*1.2152
Higher education				*1.6927

Source: Africa Centre for Health and Population Studies Demographic Surveillance System (DSS), 2001-2008

Ref=Reference category; *Significant: * $p<0.05$

for comparability between odds ratios in addition to comparing changes in model fit across models. The Bayesian Information Criteria (BIC) which measures how well predictors are doing in describing a model or the goodness of fit of a model, seems to improve over the models (STATA Manual, 2003). The BIC measure reduces by 13 460

points. This means that the specific covariates in model 4 (Table 4.6 below) have a high explanatory power in predicting female migration. Model 1 illustrates that when the number of children ever born to females (parity) is controlled for, the effect of pregnancy on probability to migrate seems to reduce. Pregnant females now have a 38 per cent less chance of migrating compared to females who are not pregnant or breastfeeding. The effect of pregnancy on probability to migrate is stronger from 0.6368 (bivariate analysis) to 0.6280 (multivariate analysis).

On the other hand, breastfeeding females now have a 47 per cent less chance of migrating compared to females who are not pregnant or breastfeeding. Females who are both pregnant and breastfeeding (multiple statuses) now have 61 per cent less chance of migrating compared to females who are not pregnant or breastfeeding. This supports the hypothesis that females who are pregnant and breastfeeding at the same time are not likely to migrate. Model 2 introduces the age covariate. By controlling for the number of children ever born to females (parity) and age, one can analyse the effect of different childbearing status on probability to migrate. This effect is further reduced in comparison to the effect of childbearing status on probability to migrate in the bivariate analysis by introducing age. The BIC measure further reduces by 0.07 per cent and this shows that model 2 has a better explanatory power than model 1 in predicting variations in female migration. It also implies that age is a key demographic factor. Pregnant females now have a 44 per cent less chance of migrating compared to females who are not pregnant or breastfeeding.

Model 4 seeks to illustrate the effect of different childbearing status categories on probability to migrate by introducing educational attainment in the model. The BIC measure reducing by 13 456 points confirms that model 4 is a better model than the others. This model is doing a better job in predicting the probability to migrate. Pregnant females have a 45 per cent less chance of migrating compared to females who are not pregnant or breastfeeding (none category). It was hypothesised that pregnant females are not likely to migrate especially in the advanced stages of pregnancy. The effect of pregnancy increased by 13 per cent from 0.6368 (bivariate analysis) to 0.5527 (multivariate analysis) and confirms that some of the explanatory power of the model was hidden in the educational attainment covariate. However it is important to note that the educational attainment covariate has some missing categories and this might have

affected the result. On the other hand, these findings are a contrast to the literature from the West which concludes that pregnant females indeed move even if for short distances or for purposes of relocating or prenatal care check-ups (Dolk, 1997; Fell, Dodds and King, 2004; Hodgson *et al.*, 2009).

The effect of breastfeeding on the probability to migrate also seems to have increased from a 48 per cent less chance of migrating in the bivariate analysis, now breastfeeding females have a 55 per cent less chance of migrating compared to females of none childbearing status. This improvement of effect of breastfeeding on probability to migrate can be attributed to the fact that the number of children ever born (parity), age, marital status and educational attainment were controlled for in the model. It is interesting to note that by controlling for childbearing status, age, marital status and educational attainment, females with four children and above now have a 12 per cent higher chance of migrating compared to females without children. The fact that females with four children and above had a lesser chance of migrating in model 1 (Table 4.6) yet now have a higher chance of migrating compared to females without children in model 4, can be attributed to the fact that all the other covariates expect parity was controlled for in model 4.

Chapter Five

Determinants of Timing of Female Migration

5.1 Introduction

This chapter seeks to show the determinants of timing of the migration by chosen covariates. Kaplan-Meier survivorship curves will be used to illustrate this relationship. The timing of migration by parity (number of children ever born to females), and stages in the childbearing process will be the focus of this chapter, in an effort to understand the impact of childbearing on female migration. The chapter will also present the Cox proportional hazard model which will show the differentials in timing of migration.

5.2 Kaplan-Meier survivorship curves

Kaplan-Meier survivorship probabilities show the length of stay in the Demographic Surveillance Area (DSA) prior to the migration move. The timing of migration is influenced by the average length of stay and is defined as the duration between the start of observation and the time spent in the DSA up until migration. The range of time is a total of 2474 days which is the difference between the start of the observation (1 January 2001) and the end of observation (1 April 2008). This means that females who were present at the start of the demographic surveillance and did not migrate, will have an observation time of 2474 days. Although all females under observation are left censored, some entered the DSA after the start of the surveillance, so these will have an observation time of less than 2474 days, but do not necessarily qualify as migrants unless they subsequently moved out of the DSA.

The timing of migration is also influenced by different covariates such as age at 2001, the number of children born to females (parity at 2001), marital status at 2002 and educational attainment between 2001 and 2003. Figure 5.1 below shows the Kaplan-Meier survivorship from out-migration by time. The timing of migration is defined in months. The months correspond to certain years e.g. 12 months correspond to the year 2001, 24 months to 2002, 36 months to 2003, 48 months to 2004, 60 months to 2005, 72 months to 2006, 84 months to 2007 and 96 months to 2008. As the years increase, the survivorship from out-migration gradually decreases gradually and consequently the number of females out-migrating from the DSA increases. Fifty per cent of the females

considered in this study migrated by 72 months (in 2006) as indicated in Figure 5.1 by the horizontal line with survivorship probabilities at 0.5. This 50 per cent represents cumulative probabilities of migrating and considers all females who migrated between 2001 and 2006. During 2006 the survivorship probability is 0.5 which implies that most of the females out-migrated the DSA between 2001 and 2006 but very few did so after 2006.

Figure 5.1 Kaplan-Meier survivorship from out-migration by time (between 1January 2001 and 1 April 2008)

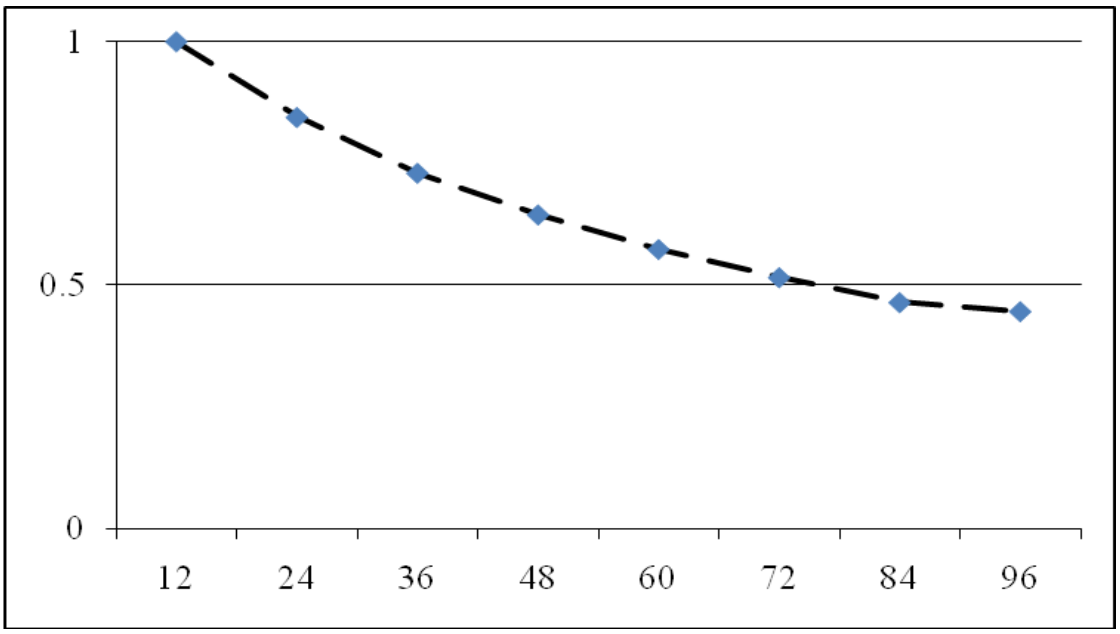


Figure 5.2 below shows Kaplan-Meier survivorship probabilities from out-migration by the total number of children a female has ever given birth to (parity at 2001) where 0 means no children, 1 represents females with one child, 2 represents females with two children, 3 represents females with three children and 4 represents females with four children and above. Timing of migration by parity is important to show the propensity of females with different parities likely to migrate. The limitation with this approach is that the parity at a point in time (parity at 2001) is taken into account and not parity at the time of migration. However, given that South African fertility is characterised by lengthy birth spacing (Moultrie and Timæus, 2002), this bias is minimised. For instance, the birth spacing interval between the first child and the second child in South Africa ranges from

5 to 7 years. This is mainly attributed to the use of contraception after the first birth (Moultrie and Timæus, 2002).

Figure 5.2 shows the gradient of timing of migration by parity, that is the higher the parity the lower the likelihood of migrating, or the later the migration will take place. Not only do females with three and four children and above have an almost similar probability of migrating but they also have high survivorship probabilities to out-migration at every given point in time. Higher survivorship for females with high parities means that females with three or four children are not likely to migrate compared to ones in other categories. On the other hand, females with zero and one child parities have an almost similar probability of migrating. There is a cross-over at 48 months (in 2003) with females with no children, but they are consistently later compared to females with one child. This spike in migration or massive out-migration from the DSA during 2003 and 2005 has also been noted by other studies (Muhwava and Nyirenda, 2007) but they do not offer reasons. These two years correspond to the months 48 and 60.

Figure 5.2 Kaplan-Meier survivorship from out-migration by the total number of children a female have ever given birth to (parity at 2001)

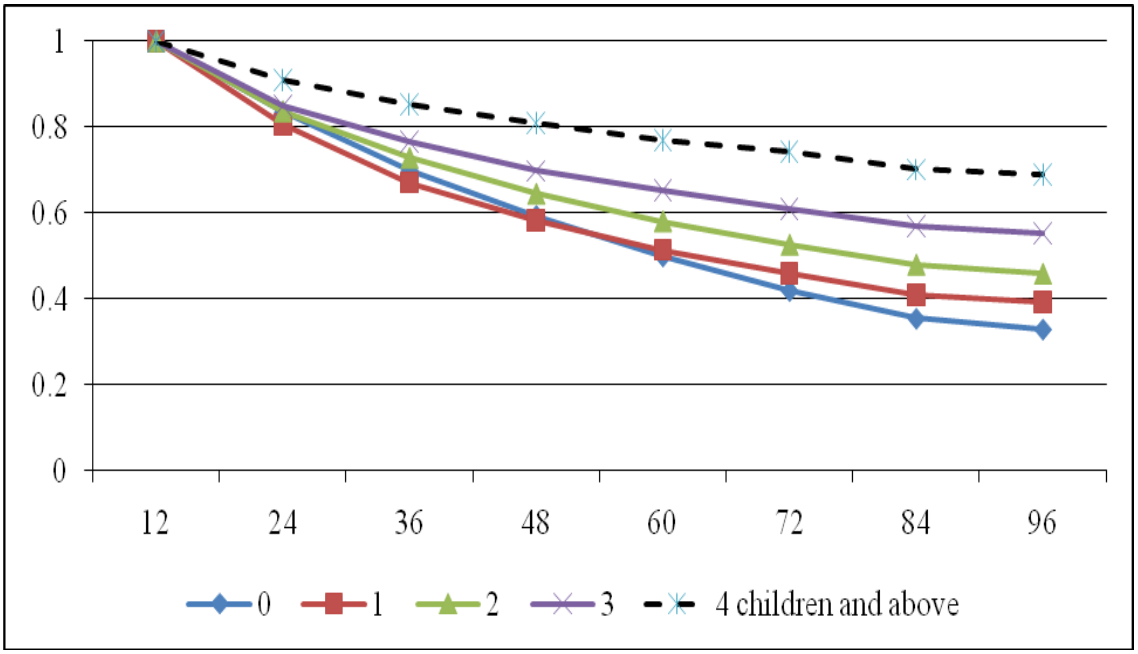
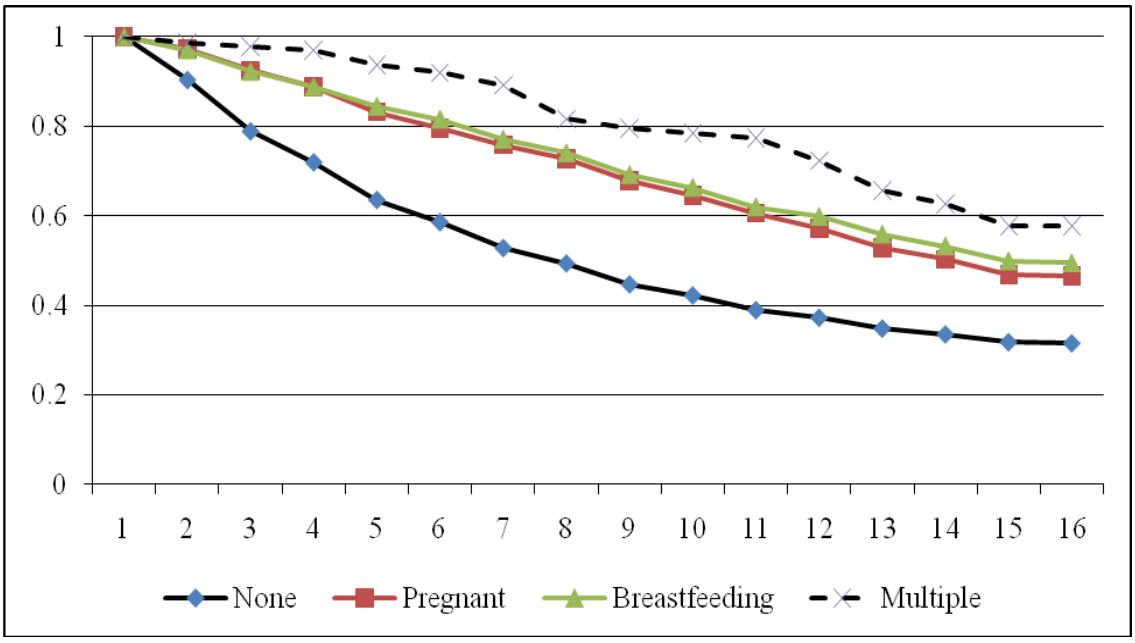


Figure 5.3 below shows the Kaplan-Meier survivorship curve for childbearing status between 1 January 2001 and 1 April 2008. This section will model the timing of

migration, that is, the period between the different childbearing statuses and the migration move. Kaplan-Meier survivorship probabilities show the length of time it took for females in the DSA to migrate after the commencement of various childbearing statuses at the time of migration, that is none, pregnant, breastfeeding and multiple. The timing of migration for childbearing status has a duration of 2474 days, which is the period between the start of the observation (1 January 2001) and the end of the observation (1 April 2008). This duration is defined in days where level 1 in Figure 5.3 represents 174 days, level 2 (348 days), level 3 (522 days), level 4 (696 days), level 5 (870 days), level 6 (1044 days), level 7 (1218), level 8 (1392 days), level 9 (1566 days), level 10 (1740 days), level 11 (1914 days), level 12 (2088 days), level 13 (2262 days), level 14 (2436 days), level 15 (2610 days) and level 16 represents 2784 days.

Figure 5.3 Kaplan-Meier survivorship from out-migration by childbearing status between 1 January 2001 and 1 April 2008



Timing of migration is also defined as the difference between the start date of any childbearing status and the date on which females out-migrated the DSA. By having the date of birth (delivery date) of the children born to females between 1 January 2001 and 1 April 2008, it is possible to calculate the date of conception by subtracting nine months from the date of delivery. The start date of pregnancy childbearing status is therefore the date of conception and the end date of this status is the date of delivery. Breastfeeding

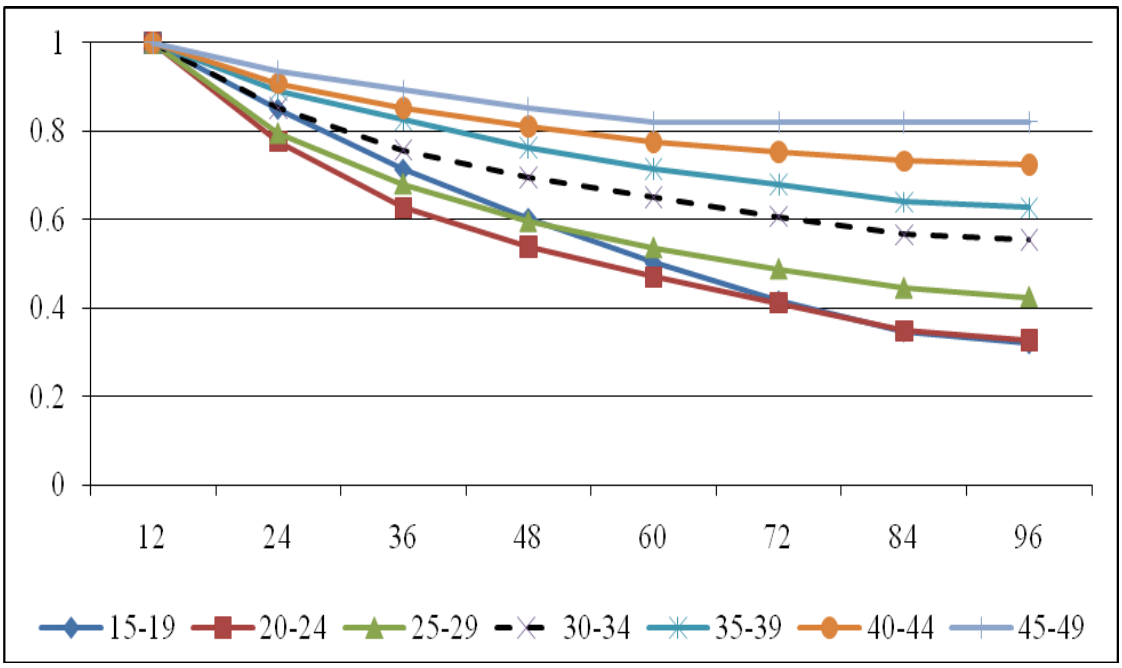
childbearing status is created for females who were breastfeeding between 1 January 2001 and 1 April 2008. Breastfeeding is assumed to take one year. Consequently it also has a start and end date. The start date is the delivery date and the end date is the delivery date plus one year. In other words, the timing of migration seeks to answer the question of how long it took for females to migrate out of the DSA after commencement of the date of conception or start of breastfeeding. Multiple childbearing status categories are created for females who are pregnant and breastfeeding at the same time during the observation period.

The Kaplan-Meier graph in Figure 5.3 shows that pregnant or breastfeeding females between 1 January 2001 and 1 April 2008 have an almost similar probability of migrating at every point in time. The fact that both the curves are almost flat at level 2 (348 days, which is approximately one year) and have high survivorship probabilities, provides evidence that these two groups are not likely to migrate before one year after the commencement of their statuses. In other words, pregnant and breastfeeding females are not likely to migrate before this period. However after level 11 (1914 days, which is approximately five years and three months), after the start of these statuses, pregnant females migrate earlier than breastfeeding females and consistently earlier compared to breastfeeding females. On the other hand, females with a none childbearing status (females who were not pregnant or breastfeeding during the observation period) are more likely to migrate earlier compared to the other three statuses and they also have low survivorship.

Multiple statuses are categories created for females who were both pregnant and breastfeeding between 1st January 2001 and 1st April 2008. Females who are both pregnant and breastfeeding have high survivorship, meaning they are less likely to migrate. The curve for females in multiple statuses seems to stagnate until level 4 (696 days, which is approximately two years) meaning that these females generally start migrating only after this period. This might be attributed to the fact these females are tied down by both having to breastfeed and expecting another child, and as a result migrate late. However after level 7 (1218 days) the curve decreases gradually. These days correspond to three years after commencement of this status, and it is plausible that these females are able to migrate since this may have been a long enough period for them to adjust to their situation.

Figure 5.4 below shows Kaplan-Meier survivorship probabilities from out-migration by age groups at 2001. The age groups 20-24 and 25-29 migrate earlier than all other age groups. There is a cross-over at 48 months with 25-29, but they are consistently late at age 20-24. Older age groups such as 40-44 and 45-49 have high survivorship to out-migration meaning these age groups are less likely to migrate.

Figure 5.4 Kaplan-Meier survivorship from out-migration by age groups at 2001



Females had more or less similar survivorship probabilities to out-migration at 24 months. The Africa Centre Demographic Information System (ACDIS) started in 2001 yet females with no child have more or less similar probabilities at 2003. It might be that at 2001 not all individuals might have been picked up in the system. As the months increase, there is a marked difference in survivorship probabilities to out-migration at every given point in time. On the other hand, a new rural development housing project near the *KwaMsane* Township began in the year 2006 and individuals have been out-migrating (Muhwava *et al.*, 2010) from the DSA ever since to settle in the housing project. The year 2006 corresponds to 72 months. One of the reasons why females out-migrated the DSA in 2006 might have been to relocate in this new housing resettlement scheme. These females might very well have been in the age groups 20-24, 25-29 and 30-34.

Figure 5.5 below shows Kaplan-Meier survivorship probabilities from out-migration by marital status at 2002. Not only are never married females more likely to migrate earlier than currently married and cohabiting females, they also have low survivorship probabilities to out-migration at every given point in time. Never married females might migrate more since they are not tied down by family responsibilities such as having to look after children, or might be out-migrating the DSA to move into the spouse's home once married. Currently married plus cohabiting and formerly married females have almost similar probabilities of out-migrating. Generally, formerly married females have high survivorship to out-migration.

Figure 5.5 Kaplan-Meier survivorship from out-migration by marital status at 2002

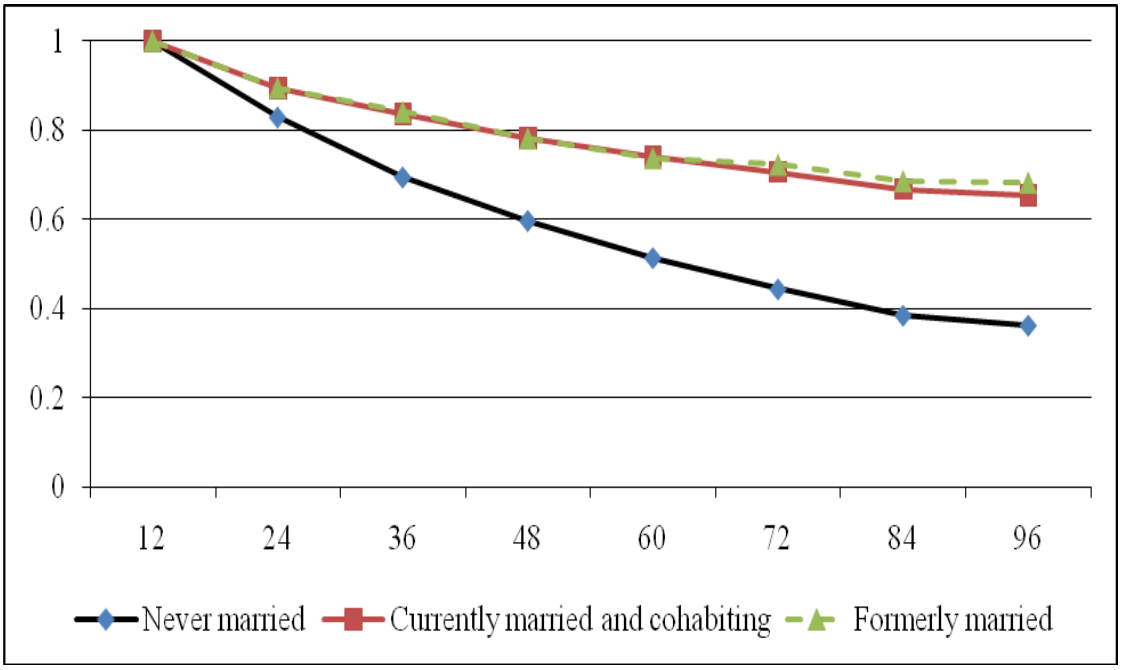
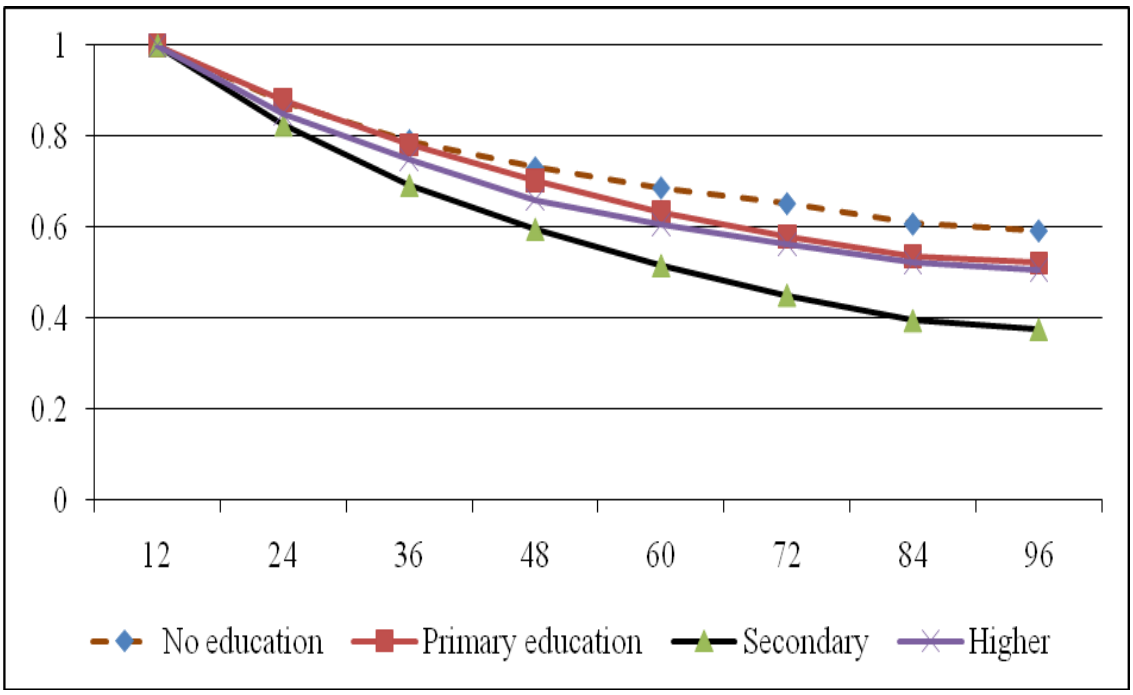


Figure 5.6 below shows Kaplan-Meier survivorship probabilities from out-migration by educational attainment between 2001 and 2003. Females with secondary school educational attainment have low survivorship probabilities to out-migration compared to all the other levels of education implying that they are more likely to migrate. In addition there is evidence that females with at least secondary educational attainment move out probably for better job prospects. There is no gradient of timing of migration by no education and primary educational attainment which confirms that females with primary school educational attainment, and females with no education have an almost similar

probability of out-migrating. However, after 36 months, females with primary educational attainment migrate earlier than females without education, implying that females with primary educational attainment are more likely to migrate compared to females with no education. On the other hand, females with higher levels of educational attainment have high survivorship probabilities to out-migration and migrate earlier than females with no education and females with primary educational attainment.

Figure 5.6 Kaplan-Meier survivorship from out-migration by educational attainment between 2001 and 2003



5.3 Hazard ratios of female migration

The Cox proportional hazard model in Table 5.1 below shows the differentials in timing of migration while controlling for different demographic and socio-economic covariates. The log likelihood, which is an indicator of the goodness of the model fit, is presented and shows that the model is statistically significant at $p<0.01$, indicating that the model is a good job predictor of timing of female migration. Pregnant females are generally not likely to migrate. Pregnant females have a 48 per cent less hazard of migrating compared to females who are not pregnant or breastfeeding (none childbearing status) whereas the same females have a 45 per cent less chance of migrating compared to females who are

Table 5.1 Cox proportional hazard model of female out-migration from the DSA (hazard ratios presented)

Log likelihood	-83187.09
Childbearing status between 1 January 2001 and 1 April 2008	
None (ref)	1
Pregnant	*0.5289
Breastfeeding	*0.4812
Multiple	*0.3540
Parity at 2001	
0 (ref)	1
1	1.0591
2	1.1138
3	1.0906
4 plus	0.9385
Age group at 2001	
15-19 (ref)	1
20-24	1.0844
25-29	*0.8889
30-34	*0.6862
35-39	*0.4979
40-44	*0.3464
45-49	*0.3001
Marital status at 2002	
Never married (ref)	1
Currently married and cohabiting	*0.7155
Formerly married	0.8192
Educational attainment between 2001 and 2003	
No education (ref)	1
Primary education	0.8653
Secondary education	*1.1846
Higher education	1.1839

Source: Africa Centre for Health and Population Studies Demographic Surveillance System (DSS), 2001-2008

Ref=Reference category; *Significant: * $p<0.05$

not pregnant or breastfeeding. Breastfeeding females are also not likely to migrate. Breastfeeding status have a 52 per cent less hazard of migrating and a 55 per cent less chance of migrating compared to females who are not pregnant or breastfeeding. Females who are both pregnant and breastfeeding (multiple status) have a 58 per cent less hazard of migrating compared to females who are not pregnant or breastfeeding. Such females might not migrate since migration is viewed as a psychological and physically challenging process especially if they are approaching advanced stages of pregnancy and

already have another baby who is breastfeeding. Such responsibilities may tie them down from migrating.

Females with one child have a five per cent higher hazard of migrating and a 10 per cent less chance of migrating compared to females with no children. This is due to the fact that multivariate analysis controls for other covariates while the timing of migration by parity considered at what time females with different parities migrate. Females with two children have both higher hazards and likelihood of migrating (11 per cent higher hazard and one per cent higher chance of migrating compared to females without children). By controlling for childbearing status, parity, age, marital status and educational attainment at given points in time, females with high parities have higher chances of migrating (a 12 per cent higher chance of migrating compared to females without children) but the timing of migration showed that these females have high survivorship probabilities at every point in time and are thus less likely to migrate. However the model for the timing of migration by different covariates shows that females with four children and above have less hazards of migrating (7 per cent less hazard of migrating compared to females without children). It can be concluded that females with four children and above are less likely to migrate compared to females without children since the timing of migration analysis considers survivorship probabilities at all points in time unlike multivariate analysis that considers likelihood of migrating separately.

Females in the ages 20-24 age group have an 8 per cent higher hazard of migrating but a 43 per cent chance of migrating compared to females in the 15-19 age group. This age group is also likely to migrate earlier than any other group. Older females seem to have less hazards of migrating compared to young females. Females in ages 45-49 have a 70 per cent less hazard of migrating compared to females in the 15-19 age group. High survivorship in timing of migration for the 45-49 age group confirmed that such females are less likely to migrate compared to the 15-19 age group and that they are also likely to migrate later than other age groups. Currently married and cohabiting females are also likely to migrate later, and this is the same with formerly married females compared to never married females (29 and 19 per cent less hazard respectively). It is interesting to note that in the multivariate analysis, when other covariates were controlled for in the model, these two categories were found to have higher chances of migrating compared to never married females (12 and 16 per cent higher chance of migrating).

Both females with primary educational attainment and secondary educational attainment have an 18 per cent higher hazard of migrating compared to females without education. The timing of migration analysis also showed that females with secondary educational attainment are likely to migrate earlier than all other educational categories. The problem associated with this result is that only educational attainment between 2001 and 2003 was taken into account and not the educational attainment at migration. The multivariate analysis shows that the effect of educational attainment on probability to migrate is high. Females with secondary educational attainment have a 21 per cent higher chance of migrating compared to females with no education (multivariate analysis). These findings support the hypothesis that educated females in rural areas are more likely to migrate to urban areas compared to ones without education.

Chapter Six
Discussions and Conclusions

6.1. Summary of findings

This chapter will discuss the conclusions by drawing on the findings of the study. This includes addressing results from the multivariate analysis and determinants of the timing of female migration. The study also provides demographic and socio-economic determinants of female migration including childbearing status (none, pregnant, breastfeeding and multiple), parity, age, marital status and educational attainment.

6.1.1 Determinants of female migration

Migration in South Africa was curtailed during the apartheid era since the Black population was settled in homelands by the White administration. The Black population was not allowed to move to the urban areas. The control of movement was enacted by laws such as the Land Act 27 of 1913 and Urban Areas Act of 1923 (Butler *et al.*, 1977; Thompson, 2000). Black males occasionally moved to urban areas in order to work in the mines and were expected to return to the homelands after providing their services to the White administration (Bozzoli, 1983; Harries, 1982). One of the growing trends of migration is the increase of female migration in post-apartheid South Africa. Females are on the move due to historic and economic factors such as the abolishment of the movement acts, thus allowing movement (Posel, 2003; Posel and Casale, 2006). In terms of geographical boundaries, internal migration in South Africa seems to be happening across provinces and KwaZulu-Natal is one of them (Kok *et al.*, 2003). According to Statistics South Africa (2006a), referring to interprovincial migration in South Africa, KwaZulu-Natal is a net sender of migrants with most moving to the Western Cape Province. A 2008 study by Rogan *et al.*, looking at internal migration in KwaZulu-Natal using the September 2005 Labor Force Survey, concluded that the Durban Metropolitan and Umgungundlovu districts in KwaZulu-Natal were net receivers of migrants from other areas.

The rural KwaZulu-Natal context is no different. The study area is referred to as the Demographic Surveillance Area (DSA) and is located in rural KwaZulu-Natal, Hlabisa Municipality. An analysis of migration in rural KwaZulu-Natal was also carried out by

the ACDIS. Studies done using the ACDIS concluded in-migration and out-migration rates during 2000 and 2005 to be increasing over time (Muhwava and Nyirenda, 2007). This study, which is also an analysis of the DSA, concludes that the levels of female migration in rural KwaZulu-Natal are high. Out of 34 807 females considered in the study, 28 per cent out-migrated the DSA between 2001 and 2008. Migration in this study was defined as out-migrating the DSA and never coming back. The determinants of female migration included childbearing status (none, pregnancy, breastfeeding, multiple) between 2001 and 2008, the total number of children ever born to individual females (parity at 2001), age at 2001, marital status between 2002 and educational attainment between 2001 and 2003. Demographic factors of female migration included parity, childbearing status, age and marital status, while the socio-economic factors included educational attainment.

Parity was concluded to be a predictor of migration. Both bivariate and multivariate analyses indicated that females with one child were not likely to migrate compared to females without children (30 per cent and 10 per cent less chance of migrating respectively). The bivariate analysis showed that females with two children had a 37 per cent less chance of migrating compared to females without children. However, multivariate analysis showed that females with two children had a one per cent higher chance of migrating compared to females without children. Parity is an important variable since South Africa has lengthy birth spacing especially between the first and second child and it is interesting to see that the proportion of females who migrated with different number of children. The percentage of migrant females who had one child and two children was 19 per cent and 10 per cent respectively.

The findings showed that age was also a significant predictor of female migration after controlling for relevant factors. This is consistent with other studies done in the DSA that confirm younger females aged between 20-24 and 25-29 were more mobile compared to older age groups (Muhwava and Nyirenda, 2007). Females in the 20-24 and 25-29 age groups had a 43 and 52 per cent less chance of migrating compared to females in the 15-19 age group. Females in older age groups such as the 45-49 age group, had an 89 per cent less chance of migrating compared to females in the 15-19 age group. This confirms the literature which proposes an inverse relationship between age and migration and concludes that as age increases, migration prospects decreases (Sandefur and Scott,

1981). This result might also be due to the proportion of migrant females in the younger age groups being higher than that of older females. Most of the migrant females were in the 15-19 age group, that is 43 per cent and less than two per cent of migrant females were in the 45-49 age group.

Studies done in KwaZulu-Natal also conclude that marital status was a predictor of female migration and that most of the females who migrate are never married (Crush *et al.*, 2005; Rogan *et al.*, 2008). This study found that 85 per cent of migrant females were never married and 14 per cent of migrant females were currently married and cohabiting. Currently married and cohabiting females had a 32 per cent less chance of migrating compared to females who have never married (bivariate analysis). However, controlling for other factors reduced this effect, where currently married and cohabiting females had a 12 per cent higher chance of migrating compared to never married females. This provides evidence that the bivariate analysis results were misleading and that what was observed was due to other omitted factors. This might also mean that currently married and cohabiting females could be concentrated in the categories of other covariates that had higher migration. For instance, age variable showed that females in 20-24 were more likely to migrate than females in the 15-19 age group. In connection with marital status, it might be that most of the females in the 20-24 age group were currently married or cohabiting. The fact that currently married and cohabiting females have a higher chance of migrating compared to never married females is contradictory to the hypothesis which argues that never married females are expected to migrate more than married females. This corroborates the fact that marital rates in South Africa are on the decline and that the proportion of married females who are migrating is thus reduced.

Educational attainment between 2001 and 2003 was also found to be an important predictor of female migration. The bivariate analysis showed that females with primary education had an 11 per cent higher chance of migrating compared to females with no education yet the multivariate analysis showed that such females had a 25 per cent less chance of migrating compared to females with no education. The fact that the chances of migrating are less in the bivariate analysis and higher in the multivariate analysis might be explained by the introduction of other covariates into the model in the multivariate analysis, yet bivariate analyses only looked at the covariate independently. On the other hand, these results might be explained by the fact that out of 9643 females who migrated,

24 per cent had missing educational attainment values which might have affected the result. However, the introduction of bias into the final results was minimised by recoding the missing values using the STATA computer program. Both the bivariate and multivariate analyses showed that females with higher education had higher chances of migrating compared to females with no education (a 61 per cent and 69 per cent higher chance respectively).

The multivariate analysis showed that pregnant and breastfeeding females were not likely to migrate compared to females who were not pregnant or breastfeeding. Pregnant females had a 45 per cent less chance of migrating whereas breastfeeding females had a 55 per cent less chance of migrating compared to females who were not pregnant or breastfeeding during the period between 1 January 2001 and 1 April 2008. This finding might be due to reasons such as the availability of antenatal hospitals or relatives being around, and there being no need to migrate elsewhere to seek childcare (Muhwava and Nyirenda, 2007). In addition, depending on the trimester of the pregnancy, females in the rural areas who are just about to give birth are not likely to move to other destinations since it might be psychically challenging (Lee, 1992). Females who were both pregnant and breastfeeding at the same time (multiple childbearing status) had a 67 per cent less chance of migrating compared to females who were not pregnant or breastfeeding between 2001 and 2008 (none childbearing status). There may be two reasons for this. First, the multivariate analysis introduced other covariates that might have influenced the effect of multiple childbearing status on the probability to migrate. Second, the proportion of females in the multiple childbearing status was small; out of 9643 of the females who migrated, less than one per cent were in the multiple category.

6.1.2 Summary of findings of timing of female migration

Determinants of timing of female migration were also analysed. The timing was defined as the number of days between the start of the observation (1 January 2001) and the end of the observation period (1 April 2008) or as the difference between the start of the observation and the time spent in the DSA up until when migration took place. The timing of migration is also influenced by different demographic and socio-economic factors including parity at 2001, childbearing status (none, pregnancy, breastfeeding, multiple) between 2001 and 2008, age at 2001, marital status between 2002 and

educational attainment between 2001 and 2003. The variables considered for this study were at a fixed time period.

Parity was found to be an important predictor of female migration. Differentials in the timing of migration by parity showed that females with four children were not likely to migrate (7 per cent less hazard of migrating compared to females without children). However females with one child compared to females without children were likely to migrate (one per cent higher hazard of migrating compared to females without children). The fact that parity used in the analysis was parity at 2001 and not parity at the time of migration minimised bias in the end results since South Africa is characterised by lengthy birth spacing. For instance the birth spacing between the first and second child is usually between five and seven years (Moultrie and Timæus, 2002). It was thus safe to assume that parity at 2001 was indeed parity at the time of migration. Females with four children and above were also more likely to migrate later than females without children. This result might be due to that fact that the proportion of migrant females with four children and above was small compared to the proportion of migrant females who did not have children. Out of the females who migrated, only 9 per cent had four children and above and 55 per cent had no children.

Age was also a predictor of timing of migration. Females in the age group 20-24 had an 8 per cent higher hazard of migrating compared to females in the 15-19 age group. This finding was also consistent with the Kaplan-Meier survivorship probabilities to out-migrate the DSA by age, which showed that the age groups 20-24 migrated earlier than all other age groups. The literature also suggests that females in the age group 20-24 migrated more than their older counterparts (Brockerhoff and Eu, 1993). These findings support the fact that younger females are mobile and more likely to migrate than their older counterparts as indicated by studies done in the DSA (Camlin, 2008; Muhwava and Nyirenda, 2007). Older females (in the 45-49 age group), had high survivorship and were more likely to migrate later compared to females in the 15-19 age group. This result may be due to the fact that the proportion of females who migrated in the 45-49 age group was lower compared to the proportion of females who migrated in the 15-19 age group. Out of all the females who migrated, 43 per cent were in the 15-19 age group and less than 2 per cent were in the 45-49 age group. Furthermore, the hazard ratios showed that females in

the 45-49 age group had a 70 per cent less hazard of migrating compared to females in the 15-19 age group.

Marital status was also found to be a predictor of the timing of migration. Currently married and cohabiting females had 29 per cent less hazard of migrating and migrated later than never married females. This result confirmed the hypothesis that married females were not likely to migrate compared to never married females. The literature confirms these findings. Given that marital rates are on the decline in South Africa, it was plausible that married females were not likely to migrate compared to never married females. The proportion of currently married and cohabiting females who migrated was small compared to the proportion of never married females who migrated (2 per cent and 84 per cent respectively). Less than 1 per cent of the females who migrated had a missing marital status variable. On the other hand, formerly married females had 19 per cent less hazard of migrating compared to never married females. The formerly married category comprised of divorced, separated and widowed females. These females also had high survivorships to migration and were therefore likely to migrate late than never married females.

The determinants of the timing of migration showed that females with at least secondary school educational attainment migrate earlier compared to females with no education and females with primary educational attainment. Both females with secondary and higher educational attainment had an 18 per cent higher hazard of migrating compared to females with no education. High levels of education were associated with high levels of migration compared to low levels of migration. This was an interesting result since studies show that the highest level of educational attainment for most South Africans above the ages of 20 was secondary education. This might mean that the proportion of females with secondary educational attainment is higher than the proportion of females with higher (or tertiary) educational attainment. Demographic and socio-economic differentials of female migrants showed that 57 per cent had secondary education and 4 per cent had higher educational attainment. On the other hand, females with primary educational attainment had a 14 per cent less hazard of migrating compared to females without education. This might be related to the fact that educational attainment and chances of finding employment are highly related. The higher the level of educational attainment an individual has, the higher the chances of finding employment. Such

prospects might trigger migration especially if the jobs are located somewhere else. If this is the case, it is plausible that females with primary education are not likely to migrate compared to females with no education.

The timing of migration by childbearing status between 1 January 2001 and 1 April 2008 such as pregnancy was found to be a significant predicator of female migration (pregnant females had a 48 per cent less hazard of out-migrating the DSA compared to females who were not pregnant or breastfeeding). The Kaplan-Meier survivorship curve for childbearing status also showed that pregnant females had high survivorships compared to females who were not pregnant or breastfeeding, and were therefore less likely to out-migrate the DSA. The hazard model with all the covariates, that is childbearing status between 1 January 2001 and 1 April 2008, the number of ever children born to females (parity at 2001), age at 2001, marital status at 2002 and educational attainment between 2001 and 2003, showed that breastfeeding females were also not likely to migrate (43 per cent less hazard compared to females who were not breastfeeding or pregnant). Females who were in the multiple category, that is, females who were both pregnant and breastfeeding at the same time, had a 65 per cent less hazard of migrating compared to females who were not pregnant or breastfeeding.

The timing of migration showed that pregnant females were not likely to migrate in comparison to females who were not pregnant or breastfeeding. It also showed that pregnant females migrate five years into the start of their pregnancy, which is five years after the date of conception. This is a different outlook from the western setting where numerous studies (Fell *et al.*, 2004; Lupo *et al.*, 2010; Nedoluzkho and Agadjanian, 2009) found pregnant females migrating far much earlier into their pregnancy than this study. Numerous reasons have been proposed why this is the case including having children born out of wedlock. The western setting proposes that if females realise they are pregnant and perceive that the child might be born out of wedlock, they might engage in marriage-related migration (Nedoluzkho and Agadjanian, 2009). Family formation in this case will be the driving force of the migration. These results might not come as a surprise since studies in the western setting also indicate that the first birth increases the likelihood of female migration (Lindstrom and Saucedo, 2007). The South African context might be different from this since marital rates have been on the decline (Posel, 2003a) and limits

the explanation that females who are pregnant engage in marriage-related migration so that their children are not born out of wedlock.

The Cox proportional hazard model, which presents the hazard ratios, indicate that any childbearing status (pregnant, breastfeeding, multiple), being in any age group between 20-49 years, being currently married and cohabiting, and having secondary educational attainment, were all significant factors (p value <0.05) in predicting the timing of female migration. Having two or three children, being in the 20-24 age group, being formerly married or having primary education was found not to be significant (p value <0.05) in predicting the timing of migration.

6.2 Conclusion

This study offered a contribution to the knowledge of determinants of female migration in rural South Africa and includes both demographic and socio-economic information. The results of this study were not nationally representative, but restricted to the Africa Centre Demographic Information System (ACDIS). Nevertheless these results showed the determinants of female migration and offered insightful findings on the demographic and socio-economic determinants of female migration in the ACDIS. Females who were pregnant and breastfeeding were not likely to migrate compared to females who were not pregnant or breastfeeding. Females with many children were not likely to migrate compared to females with no children. Females in younger age groups were likely to migrate more than older females. Females with higher educational attainments migrated more than females with no education. Demographic and socio-economic factors also influenced female migration. Factors such as childbearing status (none, pregnant, breastfeeding, multiple), the total number of children a female has ever given birth to (parity), age, marital status and educational attainment influenced female migration and the timing of female migration.

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